3.17 VISUAL RESOURCES

The Donlin Gold Project includes a variety of visual landscapes, ranging from remote and undisturbed, to industrial sites (the mine site and the oil and gas facilities at the beginning of the pipeline), and small, remote communities. This section describes the regulatory setting and summarizes the existing visual resource conditions. The methodology and findings for visual impacts are provided in subsequent sections.

The analysis area for the assessment of existing conditions for visual resources included the following components:

- Lands located within a 15-mile radius of the proposed mine site and proposed pipeline corridor, with emphasis on the modeled viewshed;
- Lands located within 2.5 miles of the Kuskokwim River, extending from Crooked Creek to Bethel; and
- Common flight paths between Anchorage, McGrath, Aniak, and Bethel, and routes associated with the Iditarod National Historic Trail.

A 15-mile radius was used in order to understand the larger landscape context of the project, and was refined based on the results of viewshed models to focus on those areas where landscape character could be directly affected by project components.

SYNOPSIS

Focusing on each proposed project component (mine site, transportation infrastructure, and pipeline) in turn, this section describes visual resources and evaluates project impacts. Specific visual characteristics considered vary depending on the land management of each geographic area drawing on visual resource management guidance from the BLM. Throughout, visual analysis includes viewshed, visual contrast, and Key Observation Points. In addition to visual characteristics of the landscape and the proposed project, visual resources analysis considers the sensitivity of viewers to visual change within a given landscape.

Along with a description of the methods used and results of analysis, a set of photographic simulations were created for 12 of 25 Key Observation Points to provide an immediate sense of estimated project effects on visual resources. These simulations also provide a way to visualize components of the proposed project as they would appear in the landscape.

Background:

<u>Viewshed</u> refers to the area that can be seen at a given vantage point. An "average viewer" is used, with an eye level of 5.5 feet. Within each viewshed identified for analysis, existing contrast value is rated as well as the degree to which project components and activities would be detectable to viewers (expected detectability).

<u>Visual contrast</u> describes the degree to which elements within a landscape stand out from one another. Visual contrast within a given viewshed is characterized as: none, weak, moderate, or strong. Visual contrast can change seasonally. For example, a brushed right-of-way (ROW) through low vegetation might have weak contrast in summer and none in winter, when both cut and uncut vegetation are covered by snow. A ROW through a spruce forest might have moderate contrast in the summer and strong contrast in the winter, when the cleared portion is white with snow while the trees are still quite dark.

<u>Key Observation Points</u> represent 25 common and/or sensitive views in the proposed EIS Analysis Area. Analysis for each of these sites, including 12 for which photosimulations were developed, gives specific information on visual resources and expected impacts. Taken together, they give an overall sense of visual resources and effects of the proposed project.

Expected Effects:

<u>Alternative 1</u>: No Action – This alternative would not affect visual resources in the area. No changes are expected beyond those that have already resulted from the exploration and baseline studies work.

Alternative 2: Donlin Gold's Proposed Action –

Mine Site: Visual changes within the proposed mine site would be of high intensity and strong contrast, localized to the vicinity of the mine site, and long-term, lasting through the operations phase of the mine and permanent for some altered landforms. No sensitive viewers (such as a community for whom a particular view is culturally or spiritually important) were identified in the viewshed of the proposed mine site, so the context for these changes is considered common. Due to topography, the visibility of changes in the mine site area from ground-based viewer locations would generally be limited to a 3-to-5-mile range due to the area's rugged terrain. Taken together, the effects to visual resources from at the mine site are considered to be moderate.

Transportation Facilities: Under Alternative 2, proposed transportation facilities would create long-term changes in landscape character along the Kuskokwim River, from barge traffic and from the proposed Angyaruaq (Jungjuk) Port. The port would be demobilized at closure of the mine, but a basic barge landing facility and access road would remain at this site in perpetuity after mine closure. Views of the proposed airstrip, which would also remain in perpetuity, would be mostly limited to ridgetops west of the mine site. Villages located along the Kuskokwim River and the river channel were considered important in context, and characterized by viewers with potentially high visual sensitivity. Taken together, summary effects to visual resources from transportation facilities are considered to be moderate. For a photosimulation of the proposed Angyaruaq (Jungjuk) Port, see Figure 3.17-18.

Pipeline: Visual effects from the proposed pipeline would be greatest in the following instances and locations: during intensive but temporary construction activities, especially in high activity areas such as locations where Horizontal Direction Drilling would be used for

river under-crossings; in forested areas due to high contrast between the forest and the cleared ROW; and, where the ROW parallels, co-occupies, or crosses the Iditarod National Historic Trail due to the important context of the trail. Apart from the Iditarod Trail, the context is considered to be common. A photosimulation of the Pipeline ROW crossing the Kuskokwim River can be seen in Figure 3.17-20. Figure 3.17-21 to Figure 3.17-25 show photosimulations of the ROW as it traverses other key landscapes.

<u>Other Alternatives</u>: The effects of Alternative 5A (Dry Stack Tailings) on visual resources would be similar to the effects of Alternative 2. Differences of note for other action alternatives include:

- Alternative 3 (Reduced Diesel Barging) would reduce annual barge traffic on the Kuskokwim River by 33 percent under Alternative 3A, and 48 percent reduction under 3B, reducing visual effects of barge travel proportionally.
- Alternative 4 (Birch Tree Crossing Port Alternative) would shift the location of the visual impact of the port, and would shorten the distance traveled by river 38 percent, avoiding the disturbance of barge traffic through the narrow segment of the Kuskokwim River in front of the communities of Aniak, Chuathbaluk, and Napaimute. These differences are not considered to alter the overall impact on visual resources.
- Alternative 6A (Dalzell Gorge Route) would increase the extent of 1,000-foot proximity
 to the Iditarod Trail from 29.4 miles (281 percent) and increase co-location to 14.5
 miles (360 percent) compared to Alternative 2. This would effectively triple the
 segment of the Iditarod National Historic Trail affected, although overall visual impacts
 are still considered moderate under this alternative.

3.17.1 REGULATORY ENVIRONMENT

Key guidance on analysis of visual impacts is found in BLM policies, outlined below. In addition, NEPA (42 USC 4371) and the Federal Land Policy Management Act (FLPMA) require impacts assessment, and visual impact assessments are an integral part of compliance. These federal laws are described in Chapter 1. Though state and local planning documents contain planning goals that pertain to scenery management, no regulations or policies exist. Consequently, this section focuses on the BLM guidance, which applies to BLM-managed lands, and not to private or state lands.

Bureau of Land Management, Land Use Planning Handbook: The handbook (BLM 2005a) states that visual resource management classes shall be designated for all BLM land based on consideration of Visual Resource Inventory (VRI) data and management considerations for other land uses. Resource use and management activities shall be managed according to the visual resource management objectives established in the land use plan.

Bureau of Land Management – Visual Resource Management System: Visual resources on BLM-administered lands are managed under the Visual Resource Management (VRM) System (BLM 1986b). The system provides the framework by which to manage visual values by classifying all BLM-administered lands into one of four visual resource management classes. Classification of lands occurs during the Resource Management Plan (RMP) development process by considering the relative visual value of lands within the context of other resource and land management needs. Visual values are established through the VRI process which classifies scenery based on the assessment of three components: scenic quality, visual sensitivity, and distance zones. Each visual resource management class is defined by a specific management objective that describes the acceptable level of change to visual resources. Change in the resource is measured though implementation of the contrast rating procedure and by assessing shifts in VRI values. The visual resource management class objectives are defined as follows:

- Class I -- Preserve the existing landscape character. This objective is assigned to areas
 with special designations such as national wilderness areas and the wild sections of
 national wild and scenic rivers;
- Class II -- Retain the existing landscape character. The level of change to the existing landscape should be low;
- Class III -- Partially retain the existing landscape character. The level of change to the characteristic landscape should be moderate; and,
- Class IV -- Allow major modification of the existing landscape character that minimizes visual impacts to the extent possible.

Bureau of Land Management – Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (Public)(BLM 2012d): These provisions provide that to the greatest extent practicable, an inventory shall be conducted for Scenic Resources, Qualities, and Values, and the Primary Use or Uses and Scenic Setting. This requirement is fulfilled by the Iditarod National Historic Trail, Seward to Nome Route: Volume 2, Resource Inventories (BLM 1982).

3.17.1.1 METHODS FOR ESTABLISHING BASELINE CONDITIONS

Baseline visual resource conditions were established by: (1) implementing a viewshed analysis; (2) completing a regulatory review to establish areas where visual resources are managed by federal, state, or local planning documents; and, (3) assessing visual resource attributes, potential viewer groups, and visual distance zones (visibility) within the analysis area.

The viewshed analysis is a GIS-based tool to identify locations where a project feature could potentially be visible. It indicates areas where visual resources could be affected by that project component. The results of the analysis are used to refine the analysis area; both identifying specific viewer locations within that area and confirming whether those areas are managed for the protection of visual resources.

The viewshed analysis determines potential project visibility based on the relationship between topography, height of project components, average eye height of the viewer, and height of vegetation. Additional information on the viewshed analysis method found in Section 3.17.3.1.1, along with results of that analysis, is presented in the sections that follow.

The regulatory review included federal, state and local planning documents for planning areas with a geographic nexus to the Project Area. The review focused on identifying specific regulations or planning objectives pertaining to visual resources or scenery management.

Visual resource attributes were assessed by first dividing the analysis area into geographic units defined by prevailing physiography (Wahrhaftig 1969), then assessing landscape character in each geographic unit (See Figure 3.17-1 for an example from the Kuskokwim Mountains Physiographic Province). Landscape character attributes were described in terms of the basic elements of form, line, color, and texture of prevailing landform, water, vegetation, and cultural modification. This approach was applied across the analysis area to ensure that baseline data in visual resources was collected consistently across all jurisdictions. Where the analysis area crossed BLM-administered lands, existing baseline VRI data from the Ring of Fire RMP (BLM 2006) and the Natural (Scenic) Inventory of the Iditarod National Historic Trail (INHT) Seward to Nome Route (BLM 1982) was incorporated into baseline data. VRI data were not available for the Bering Sea-Western Interior planning area (BLM 2015c). No ranking of scenic quality was completed on non-BLM-administered lands as part of this assessment. Landscape character attributes were assessed at representative analysis locations established across the EIS Analysis Area, and through aerial observations made from helicopter.

Viewer groups were identified through review of scoping comments and review of analyses for recreation, cultural resources, and subsistence. These sources were used to understand how specific locations within the analysis area are used, and the types of viewer groups that may be associated with those uses. Characteristics of identified viewer groups, such as seasonality of use, amount of use, and predominant viewer activity were considered in this inventory. No assumption of visual sensitivity was made for viewer groups located in areas outside of BLM-administered lands. Instead, the context of viewer locations was classified as common, important, or unique in the impact criteria for visual resources (Table 3.17-1).

For BLM-administered lands, the assessment of viewer groups included baseline data on visual sensitivity (i.e., measure of public concern for the scenic quality of a given area) collected as part of the VRI of the Ring of Fire RMP (BLM 2006). The estimation of visual sensitivity for users of BLM-administered lands is based on the following criteria: (1) Type of Users; (2) Amount of Use; (3) Public Interest; (4) Adjacent Land Uses; and (5) Special Areas (BLM 1986b). This information was used to assign visual sensitivity to inventoried areas.

Viewer exposure and potential project visibility was assessed, in part, by classifying relative distance from travel routes or observation points into three distance zones: foreground-middle ground (3 to 5 miles), background (5 to 15 miles), and seldom seen (areas located beyond 15 miles or areas hidden from view) (BLM 1986b). Common travel routes included the Kuskokwim River, routes associated with the INHT (including common flight paths), and common flight paths between Anchorage and Aniak.

3.17.2 AFFECTED ENVIRONMENT

The EIS Analysis Area included diverse physiography of southwest Alaska, including: Yukon-Kuskokwim Coastal Lowlands, Kuskokwim Mountains, the Nushagak-Big River Hills, the Tanana Kuskokwim Lowland, the Alaska Range, and the upper Matanuska River Valley (see Figure 3.1-1, Geology, for a project location map). Landscape character attributes for portions of the analysis area that intersect these broad areas are described below.

3.17.2.1 MINE SITE

The proposed mine site is located in the Kuskokwim Mountains physiographic province (Wahrhaftig 1969) (Figure 3.17-1). Though the mine site is located on lands owned by the Kuskokwim Corporation and Calista Corporation, the visual resource analysis area for the proposed mine site also includes lands owned and administered by the State of Alaska and BLM. The landscape within the Kuskokwim Mountains physiographic province is characterized by low to moderate topographic relief, with elevations ranging from 500 to 1,500 feet (150 to 460 meters) above sea level. The landscape is large in scale, with views from ridge tops largely panoramic; however more enclosure is in drainages and low elevation areas. Topography is dominated by numerous rounded hills that appear as consistent and well-defined by the converging lines of drainages. Vegetation on hilltops is dominated by short alpine tundra with areas of exposed rock. Patches of black spruce, tamarack, alder, and birch are limited as much of these stands appear charred and void of foliage due to extensive tracts of wildfire damage (Figure 3.17-1).

Areas characterized by more contiguous mixed spruce and aspen forest exist in the eastern portion of the unit. Deciduous trees are concentrated in drainages, adding contrast and distinction to these features. The George River, East Fork George River, and Moose Creek are evident as distinct, broad, U-shaped river valleys characterized by the vivid green and soft texture of muskeg and the stippled texture of black spruce forest. These lowland areas are small in scale and enclosed. A communication tower is located west of the Kuskokwim River. Overall, the landscape appears natural and intact. However, in the vicinity of the proposed mine site, evidence of cultural modification is evident due to existing infrastructure including a network of two-track trails, mine camp facilities, and the airstrip (Figure 3.17-2). Landscape absorption, the capacity for incorporating visual change, is considered high due to varied topography and natural variability in vegetation types.

Viewer groups in this area are limited to individuals engaged in widely dispersed subsistence or recreation activities, and exposure is low due to remoteness of area and lack of access and infrastructure (see Section 3.16.2.2.1, Recreation). For example, in 2011 and 2012, the region cumulatively received less than four percent of the state's visitor volume annually (McDowell Group 2013; LKEDC 2006; LKEDC 2012). No permanent habitations are located within approximately 9 miles of the proposed mine site (ARCADIS 2012f). Small-scale mining operations exist within the analysis area (Section 3.15, Land Ownership, Management, and Use). The proposed mine site is located in the seldom seen distance zone. Due to the topography of the area, the mine site would not be visible from any inhabited place, the Kuskokwim River, or the navigable parts of its tributaries.



Note winding channel of Crooked Creek in foreground of image.



DONLIN GOLD PROJECT EIS



LANDSCAPE CHARACTER OF THE KUSKOKWIM MOUNTAINS PHYSIOGRAPHIC PROVINCE

Data Sources: URS (2013)

NOVEMBER 2015







EXISTING INFRASTRUCTURE OF THE DONLIN MINE CAMP

Data Sources: URS (2013)

NOVEMBER 2015

3.17.2.2 TRANSPORTATION FACILITIES

The transportation facilities are located in three physiographic provinces: the Aleutian Islands (fuel and cargo facilities in Dutch Harbor), Kuskokwim Mountains (mine access road), and Yukon-Kuskokwim Coastal Lowland (river transportation and port). The proposed facilities in Dutch Harbor would be situated amidst an active commercial hub, containing marine facilities and docks to support fuel, heavy freight, light cargo, and small boats. The proposed mine access road would extend from Jungjuk port (or Birch Tree Crossing port) on the Kuskokwim River to the mine site. The corridor passes through the Kuskokwim Mountains physiographic province, where the landscape is characterized by the varied topography and vegetation previously described for the mine site component (Section 3.17.2.1). Where the corridor approaches the Kuskokwim River, topography is broad and flat, and vegetation is dense and contiguous.

The transportation facilities and activities include portions of the Kuskokwim River located within the Kuskokwim Mountain and Yukon Kuskokwim Coastal Lowland physiographic provinces. The portion of the Kuskokwim River affected by the proposed project and located in the Kuskokwim Mountains physiographic region includes the river corridor from approximately from the Holokuk River, upriver to the village of Crooked Creek, (while the province boundary is located further upriver near Sleetmute) (Wahrhaftig 1969). The landscape is characterized by the broad, flat river channel, and the more contiguous, steep and proximate mountains and rock formations that border the river channel. This river segment is bordered by the Kuskokwim Mountains.

The portion of the Kuskokwim River affected by the proposed project and located in the Yukon-Kuskokwim Coastal Lowlands physiographic region includes the river corridor from approximately from Holokuk River to the river mouth (Wahrhaftig 1969). Several noteworthy landforms exist adjacent to the river, including the Russian Mountains and Owhat Cliffs (Figure 3.17-3). Scenic integrity is high and the landscape appears natural.

Villages and remote residences and fish camps are present along the river. Villages appear as distinct nodes characterized by the presence of structures in upland areas and boats lining the shoreline. Increased activity is often evident in these locations (Figure 3.17-4). Landscape absorption, which describes the ability of the landscape to accept physical alternations without visual character changes, is considered moderate. This is due to limited visibility from river channel, varied topography and vegetation, and narrow field of view from villages due to bends in the river.



Owhat Cliffs on the Kuskokwim River, downriver of the confluence of the Owhat and Kuskokwim Rivers.



DONLIN GOLD PROJECT EIS



OWHAT CLIFFS ON THE KUSKOKWIM RIVER

Data Sources: URS (2013)

NOVEMBER 2015



Barge unloading at the Village of Chuathbaluk on the Kuskokwim River.





BARGE UNLOADING AT THE VILLAGE OF CHUATHBALUK

Data Sources: URS (2013)

NOVEMBER 2015

This portion of the analysis area includes the Kuskokwim River as it flows through the external boundary of the Yukon Delta National Wildlife Refuge, i.e., downriver from about Aniak. The landscape character is dominated by the broad, flat Kuskokwim River. The river appears broad, flat and curvilinear. The riverbank is generally low relief, steep and vertical, descending sharply to a flat shoreline dominated by grey/brown gavel and cobble. The landscape varies from highly enclosed due to riparian vegetation (black spruce, balsam poplar) and cutbanks, to broad and panoramic, with views extending across the vast, flat wetland/tundra complex. In the upriver portion of the province, mountains are visible in the background (Figure 3.17-5). These landforms appear as discrete, dome-shaped to flat-topped landforms that rise steeply from the flat topography in the foreground, providing enclosure to the landscape that appears otherwise large in scale. Downriver of Lower Kalskag, topography is characterized by the broad, flat, delta (Figure 3.17-6). Despite flat topography, the landscape often appears enclosed due to the steep cutbank of the river and associated riparian vegetation.

Villages and seasonal camps are present along the river. Air traffic is common in the vicinity of Aniak. Bethel serves as a transportation and shipping hub for the river, and is the largest and most urbanized of the communities in this area (ARCADIS, 2012f). A communication tower, gravel quarry, and associated roads are visible in mountains surrounding Upper and Lower Kalskag. Though evident, these features do not dominate views, and the landscape appears natural. Landscape absorption is considered moderate due to limited visibility from the river channel due to enclosure created by riverbanks. Though views extend for greater distances from home sites located at higher elevations above the waterline, a narrow field of view remains due to bends in the river.

Viewer groups along the Kuskokwim River include residents, individuals engaged in subsistence hunting, fishing, and gathering; recreationists engaged in hunting and fishing; local small boat travelers; and commercial boat or barge operators. Year round residential villages have a combined population of 9,140 residents (see Table 3.18-2). Activity is concentrated around communities during the fishing season, particularly in the Bethel area between Napakiak and Akiachak, as this area corresponds to the densest human population along the river. Lodge accommodations offering local hunting and fishing guide services exist in Crooked Creek, Red Devil, and Sleetmute. The in-river barge season extends from ice-out to freeze-up, generally corresponding to the period between early June and early October (ARCADIS 2013a). Concern for preservation of visual resource values has been expressed by communities along the river (Feyereisen 2013b). Scenic integrity was identified as important for potential development of sustainable tourism (LKEDC 2006). Additional sensitivities to maintaining intact landscape character could exist for the Yukon Delta National Wildlife Refuge, though management standards are not explicit for visual resources. The proposed transportation facilities are located in the foreground/middle ground distance zone (river), and background/seldom seen (mine access road).



Kuskokwim physiographic province as viewed from the Kuskokwim River at Crow Village.



DONLIN GOLD PROJECT EIS



TYPICAL LANDFORMS OF THE UPRIVER PORTION OF THE YUKON-KUSKOKWIM COASTAL LOWLANDS

NOVEMBER 2015



Characteristically flat topography of the lower Yukon-Kuskokwim Coastal Lowlands physiographic province. View is directed downriver from the Village of Lower Kalskag.

Data Sources: URS (2013)



DONLIN GOLD PROJECT EIS



CHARACTERISTICALLY FLAT TOPOGRAPHY OF THE LOWER YUKON-KUSKOKWIM COASTAL LOWLANDS

NOVEMBER 2015

3.17.2.3 PIPELINE

The pipeline traverses the Kuskokwim Mountains, Holitna Lowland, Nushagak-Big River Hills, Tanana Kuskokwim Lowland, Alaska Range, and the upper Matanuska Valley physiographic regions. Though characterized by diverse physiography, scenic integrity along the majority of the pipeline route is very high, appearing natural with no human-made large landscape modifications (i.e., linear transmission lines, logging areas, maintained road systems) between pipeline MP 7 and MP 315. With the exception of the Farewell and Puntilla airstrips, there are no linear or geo-rectangular vegetation clearings, installations, transmission lines, or transportation systems evident in this landscape setting. The natural vegetation in most of the area is unmodified.

The Kuskokwim Mountains physiographic unit encompasses the mine site component and was previously described in Section 3.17.2.1. The proposed pipeline ROW crosses the diverse topography of the Kuskokwim Mountains, generally following ridgelines where vegetation is dominated by low-growing tundra. Within this physiography, the proposed pipeline ROW crosses Moose Creek, the George River and the East Fork George River; two tributaries to the Kuskokwim River located east of the proposed mine site. These tributaries appear distinct in the larger landscape due to their broad valleys and distinct curvilinear lines created by the river channel and associated riparian vegetation (Figure 3.17-7).

The Holitna Lowland physiographic region includes the river corridor from approximately from the Village of Sleetmute, upriver to Devil's Elbow (Wahrhaftig 1969). This unit is characterized by broad, rounded topography and dense, contiguous mixed-deciduous forest that extends to water's edge (Figure 3.17-8). Exposed cobble on river banks is common. The river channel appears broad, flat, and more channelized than lower river segments. Scenic integrity is high, and the landscape appears natural. Landscape absorption is considered low to moderate. The viewshed of the river is variable, based largely on height of riverbank and density of vegetation. Villages are characterized by a narrow field of view due to bends in the river.

The Nushagak-Big River Hills physiographic province is characterized by rounded, shallow, flat-topped ridges and broad hills. Vegetation is characterized by widely spaced and short spruce trees and extensive areas of aspen-dominated forest. Open meadows are common, appearing as irregular shaped clearings often associated with meandering creeks or sloughs. No villages or communities exist in this unit and the landscape appears natural.

The Tanana Kuskokwim Lowland physiographic province is dominated by broad, gently sloping topography that descends northwest from the Alaska Range toward the Kuskokwim River (Figure 3.17-9). Vegetation ranges from dense spruce to open, irregular-shaped meadows dominated by shrub and tundra vegetation. Networks of small lakes are apparent due the contrast in the flat reflective surface against the surrounding greens and browns of upland tundra vegetation. Numerous broad, flat, braided river channels drain to the Kuskokwim River. River banks are variable ranging from broad to steep upland forest and are typically densely vegetated. Views to the southwest are dominated by the steep, rugged peaks of the Alaska Range (Figure 3.17-10). Views to the northwest are large in scale and panoramic extending across the broad lowlands. Isolated, dome-shaped landforms provide localized areas where views are enclosed. Two-track trails are evident in drainages and upland areas. No villages or communities exist in this unit and the landscape appears natural.



The George River basin, a tributary to the Kuskokwim River. View is directed west across river .





THE GEORGE RIVER BASIN

Data Sources: URS (2013)

NOVEMBER 2015



The Kuskokwim River, approximately ¼ mile downriver of Devil's Corner at location of proposed ROW crossing.





KUSKOKWIM RIVER 1/4-MILE DOWNRIVER OF DEVIL'S CORNER

Data Sources: URS (2013)

NOVEMBER 2015



Tanana Kuskokwim Lowland physiographic province at the location of the proposed right-of-way. View is directed to the northeast, from an upland location approximately 5 miles from the Big River. Note foothills of the Alaska Range in right side of image.



DONLIN GOLD PROJECT EIS



TANANA KUSKOKWIM LOWLAND PHYSIOGRAPHIC PROVINCE

Data Sources: URS (2013)

NOVEMBER 2015



The Big River at the location of the proposed right-of-way.





BIG RIVER AT THE LOCATION OF THE PROPOSED ROW

Data Sources: URS (2013)

NOVEMBER 2015

Across the Alaska Range physiographic province, landscape character is dominated by the extensive rugged and jagged mountains and the broad, U-shaped river valleys. The landscape is large in scale and enclosed by ridgelines. Broad river valleys cut through the rugged terrain, and are often marked by sinuous river drainages or lakes. Examples of this physiographic province are displayed in Figure 3.17-11, which shows the South Fork of the Kuskokwim and the northern edge of the Alaska Range, and Figure 3.17-12 which shows the Happy River valley, located in the Alaska Range southeast of Rainy Pass.

Lower elevation slopes and valleys range from open tundra to areas of dense, contiguous spruce-dominated forest (Figure 3.17-13). Lodges and cabins exist in this unit, though these structures are remote and less dominant than the scale of the landscape. The upper Matanuska Valley physiographic province is characterized by the broad wetland complexes and braided river channel of river valleys of the Skwentna, Yentna, and Susitna rivers. Beluga Mountain, Little Susitna Mountain, and Mount Susitna appear as discrete, dome-shaped landforms that rise for the broad lowlands (Figure 3.17-14). Development is more common, consisting of widely scattered lodges and private cabins near the mouth of the Talachulitna River and along Shell Lake (ARCADIS 2013a). Industrial activity is concentrated in the vicinity of the terminus, characterized by road networks, oil and gas pads, pipelines and processing facilities, a power plant, and associated electrical transmission lines (ARCADIS 2013a).

Viewer groups across the pipeline analysis area are varied. In the Tanana-Kuskokwim Lowlands, viewer groups primarily consist of individuals engaged in subsistence and/or recreational hunting and fishing. Guided recreation is common on the Big River, Talachulitna River, and Skwentna River (ARCADIS 2013a). In the Alaska Range and Susitna Lowlands, primary viewers include users of the INHT, including recreationists and tourists. Predominant use of the trail on the south side of the Alaska Range is during the winter months when the trail is used for Iditarod Trail Sled Dog Race, the Northern Lights 300, the Knik 200, the Junior Iditarod Sled Dog Race, the Iron Dog snowmachine race, and the Iditarod Invitational (Nordic skiers, mountain bikers, snowshoers, and runners). The INHT Comprehensive Management Plan (BLM 1982) identifies "significant viewpoints" at Happy River/Skwentna River confluence, Rainy Pass, Dalzell Gorge, and Rohn Roadhouse areas, and identifies Kohlsaat Peak north of the Rainy Pass Lodge, Pyramid Mountain, Mount Susitna and Beluga Mountain as "important landmark features" (BLM 1982). The Talachulitna River is a designated State Recreation River (ADNR 1991).

Viewer groups may also include commercial and small-craft air travelers. The Kuskokwim River region is currently served by commercial air services from Anchorage to McGrath, Aniak, and Bethel. Local air service operators provide flights from these regional hubs to smaller villages along the river and throughout the region, including strips established adjacent to mining areas and lodges. There is a state-owned airstrip in Skwentna. Fly-in guide services and river boat guides provide the most common access for outdoor recreation enthusiasts. Small aircraft also provide flightseeing, logistic and visual support for multiple organized events associated the INHT.

For the purpose of this analysis, visual distance zones were established using commonly traveled routes within the analysis area, including routes associated with the INHT, the Kuskokwim River, and established flight paths.



The South Fork of the Kuskokwim the northern edge of the Alaska Range.

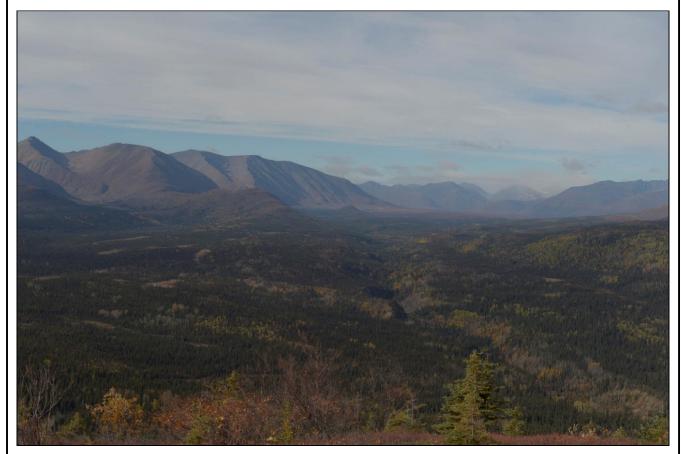




SOUTH FORK KUSKOKWIM RIVER

Data Sources: URS (2013)

NOVEMBER 2015



Happy River valley, located in the Alaska Range southeast of Rainy Pass. Note broad, flat valley floor and incised river canyon.





HAPPY RIVER VALLEY

Data Sources: URS (2013)

NOVEMBER 2015



Dense, contiguous spruce forest located east of Happy River, north of Skwentna.





SPRUCE FOREST EAST OF HAPPY RIVER

Data Sources: URS (2013)

NOVEMBER 2015



Open wetland meadows of the upper Matanuska Valley, northeast of Beluga Mountain. Note trail marker for the Iditarod National Historic Trail.



DONLIN GOLD PROJECT EIS



WETLAND MEADOWS OF UPPER MATANUSKA VALLEY

Data Sources: URS (2013)

NOVEMBER 2015

3.17.2.4 CLIMATE CHANGE

Visual resources in the EIS Analysis Area have been and will continue to be influenced by climate-related changes in vegetation and the physical environment. Climate modeling predicts a shift in vegetation community types in Alaska, resulting from fire regime changes, drier landscapes with a higher proportion of shrubs and trees than tundra vegetation types, and areas of subsidence that may fill with water and drain adjacent wetlands. These shifts may be evident in some locations, and may change the visual landscape over time. Vegetation changes would be variable as most of the EIS Analysis Area is in areas of discontinuous, sporadic, or isolated permafrost. Ground subsidence and erosion from warming permafrost are visually observable phenomena related to climate change that may affect the visual landscape in localized areas (Section 3.26.3.4.1, Climate Change).

3.17.3 ENVIRONMENTAL CONSEQUENCES

This section addresses direct and indirect effects expected to result from construction, operations, and closure of the project under all proposed alternatives, including the No Action Alternative. The project would operate using common features and environmental protection measures described in Section 2.3.2, Chapter 2, Alternatives.

For the visual analysis area, the indicators used to measure potential impacts to visual resources include:

- Change in character attributes of landscapes and villages, based on expected visual contrast, scale dominance, viewer exposure, and geographic extent of contrast.
- Change in scenic quality classification of the INHT, based on expected change to scenic quality values provided in the INHT Comprehensive Management Plan (BLM 1982).
- Change in integrity of view areas, significant viewpoints, and/or important landmark features identified in the INHT Comprehensive Management Plan (BLM 1982) based on magnitude and geographic extent of expected impacts.
- Change in VRI values of BLM-administered lands based on magnitude and geographic extent of expected impacts; and
- Conformance with existing VRM Class III objective(s) based on level of visual contrast expected to result from the proposed action.
- Additional qualitative indicators include the expected level of change to the existing landscape aesthetic such as lighting, movement, activity (measured in terms of change in vehicular traffic and amount of people), or naturalness.

The impact ratings were based on the factors presented Table 3.17-1.

- The *magnitude* of impacts to visual resources, measured by the level of visual contrast created by the project. Magnitude was also informed by the scale of contrasting features relative to the existing landscape, and the anticipated exposure of viewers to these features.
- The *duration* of impacts, measured by the anticipated temporal extent of impacts (i.e., temporary, long-term, permanent).

- The *geographic extent* of impacts, measured by the degree to which the affected area includes immediate foreground (<3 miles), foreground-middleground (3-5 mile), background views (15 miles), or seldom seen (beyond 15 miles) distance zones.
- The context of the impact, measured by the estimated sensitivity of viewers, applicable
 legislative protection of visual resources, and the potential for impacts to alter the
 human experience of the landscape. For BLM-administered lands, construction-related
 impacts are not discussed in the context of conformance to VRM objectives, as this land
 use standard applies to long-term or permanent impacts.

Table 3.17-1: Impact Criteria for Visual Resources

Magnitude or Intensity	Low – Project components result in low to no visual contrast against the existing landscape, viewer duration is prolonged or transient, and experienced from foreground-middleground or background distance zones.	Medium – Project components result in moderate to high visual contrast against the existing landscape, viewer duration is prolonged or transient, and views are experienced from foreground-middleground or background distance zones.	High – Project components result in high visual contrast against the existing landscape, viewer duration is prolonged, and views are experienced from foreground-middleground distance zones.
Duration	Temporary – Changes to landscape character would last only for the duration of project construction (up to 4 years).	Long-term – Changes to landscape character would extend through the life of the project (27.5 years).	Permanent – Changes to landscape character would last longer than the estimated life of the project.
Geographic Extent (Viewshed Iimiting factors) ¹	Local – The geographic extent of the affected area would not extend beyond the foreground-middleground distance zone (3-5 miles); key factor used to rank scenic quality in affected SQRU(s) could be changed; however, no change to VRI values for affected SQRUs would result.	Regional – The geographic extent of the affected area would extend to the background distance zone (15 miles) and/or VRI scores for affected SQRU(s) would be altered.	Extended – The geographic extent of the affected area would extend beyond the background distance zone (15 miles) and VRI scores for affected SQRU(s) would be altered.
Context	Common –The affected area is ranked as VRI Class IV (low visual value), and/or is managed by VRM Class III or IV Objectives. The affected area is not recognized for its scenic value.	Important – The affected area is ranked as VRI Class II (high visual value) or III (moderate visual value), and/or is managed by VRM Class II or III Objectives. The affected area may be recognized for its scenic quality, though scenic resources are not protected by existing legislation.	Unique – The affected area is ranked as VRI Class I, and/or is managed by VRM Class I Objectives, or other legislation aimed at the protection of visual resources.

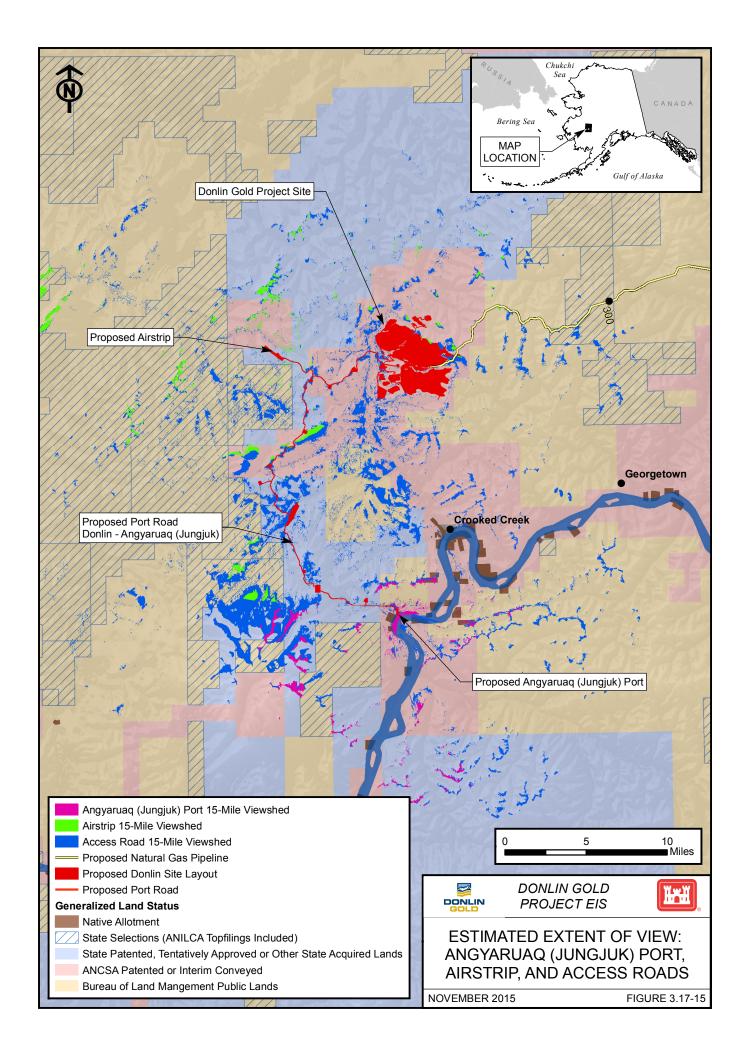
3.17.3.1 METHODS

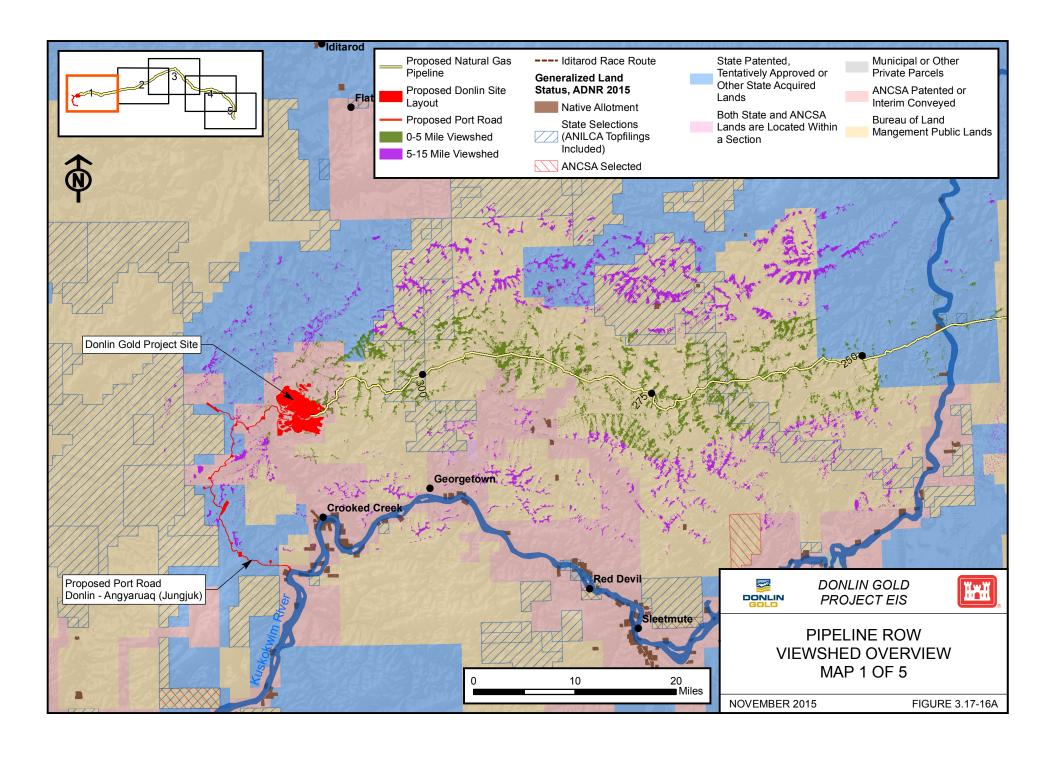
3.17.3.1.1 VIEWSHED ANALYSIS

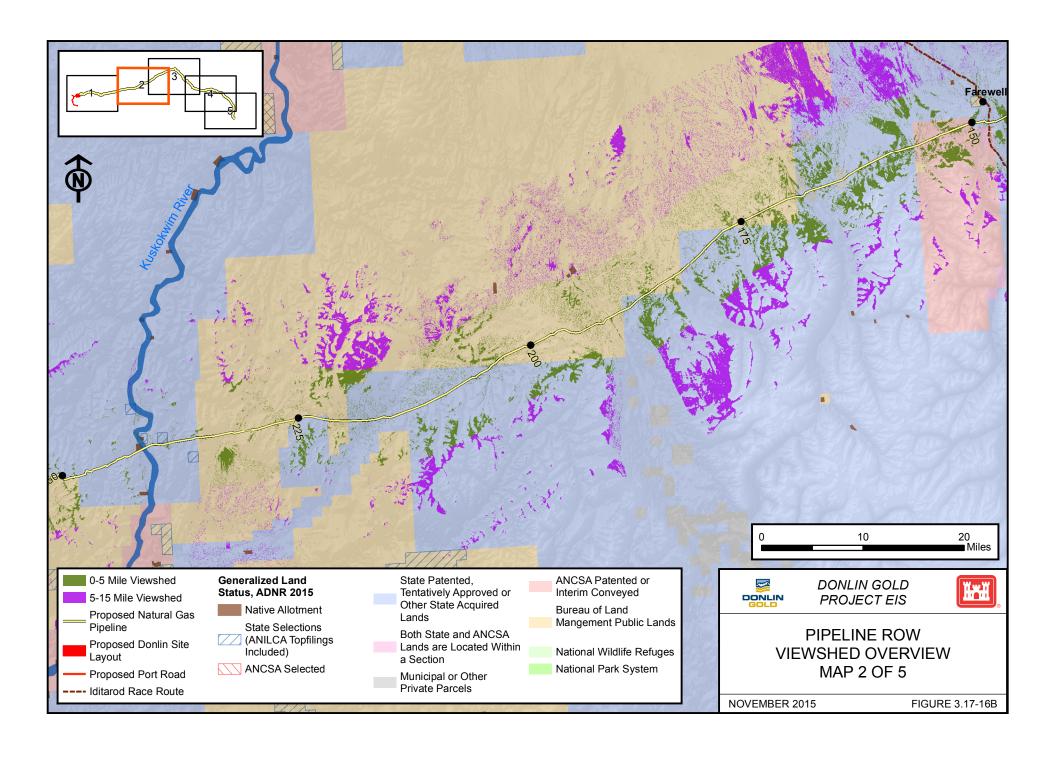
Potential project visibility was determined by implementing a GIS-based viewshed analysis based on the relationship between topography, vegetation, project features, and average eye height of the viewer. The resulting "seen area," or viewshed, represents the area where project components could theoretically be seen; however, it does not represent actual detectability of these features. Input parameters were defined by eye level of 5.5 feet and vegetation height per the National Land Cover Dataset (EPA 2001b). The viewshed was based on the project configuration as presented in Alternative 2. The estimated geographic extent of views for the mine site, including Angyaruaq (Jungjuk) Port, the airstrip, and the mine access road, is shown in Figure 3.17-15. For the pipeline ROW, the estimated geographic extent of views is shown in Figure 3.17-16A through Figure 3.17-16E. The theoretical extent of views from the villages located between Lower Kalskag and Napaimute was also calculated using the viewshed analysis procedures (Figure 3.17-17A through Figure 3.17-17E). This analysis was performed to understand the geographic extent and duration of potential views of transiting river barges from villages on the Kuskokwim.

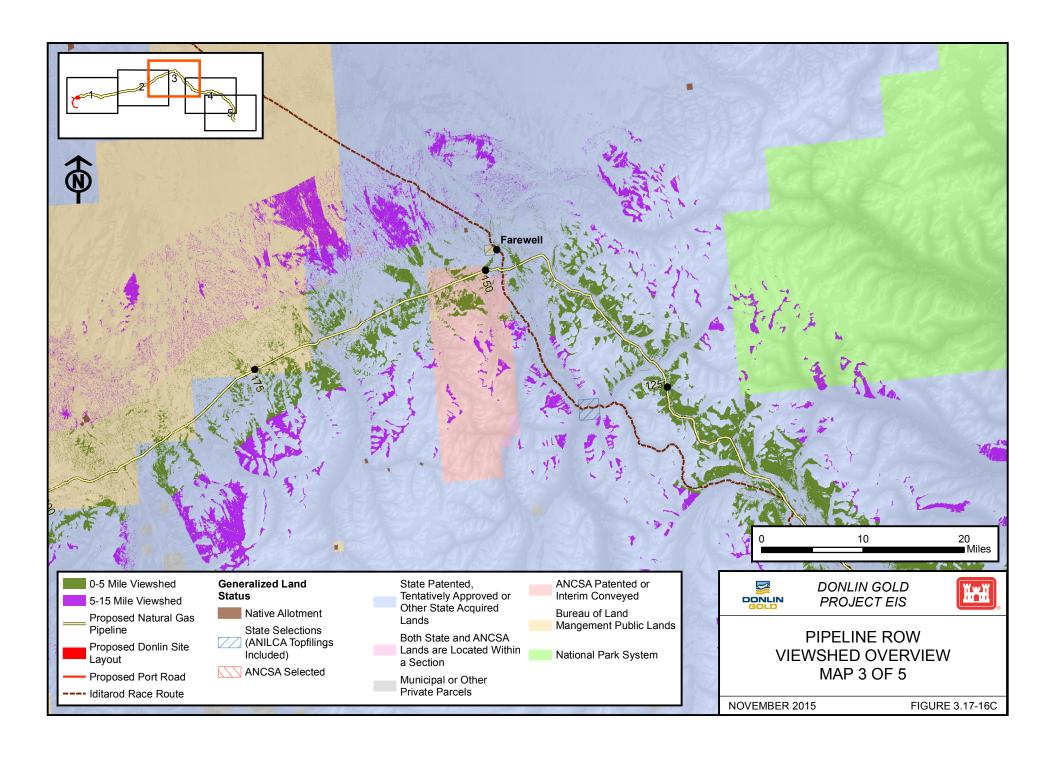
3.17.3.1.2 KEY OBSERVATION POINTS

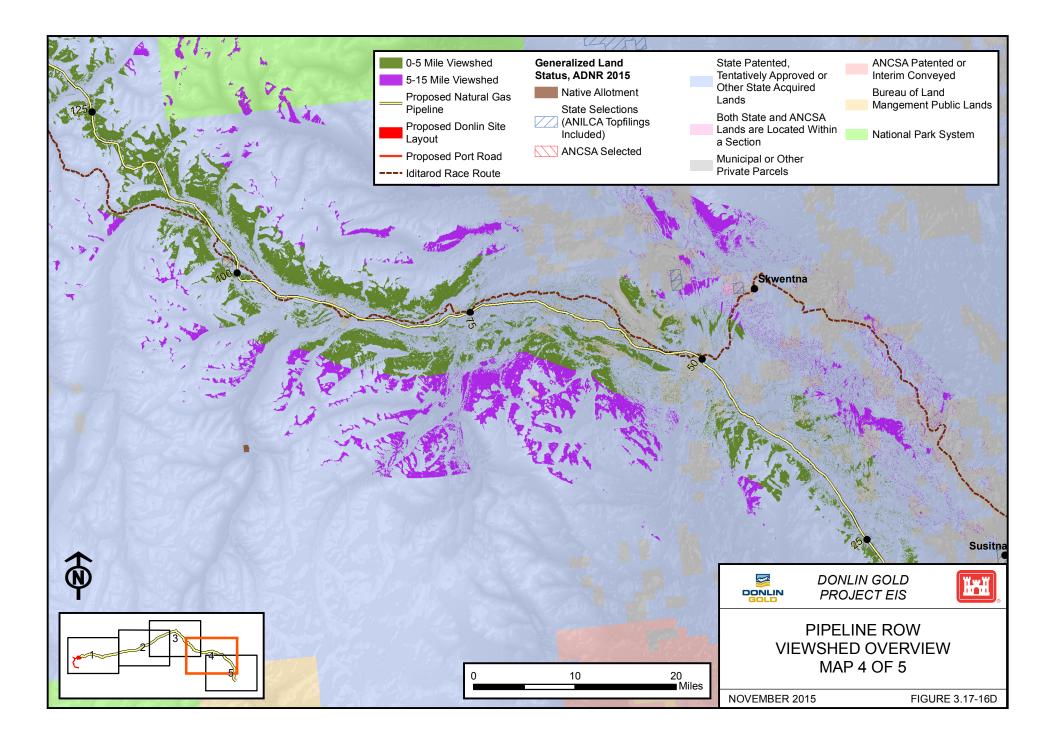
The impact analysis was used by information on landscape character attributes and anticipated change collected from 25 Key Observation Points (KOPs) representing common and/or sensitive views. Emphasis was placed on villages along the Kuskokwim River between Crooked Creek and Lower Kalskag, the INHT, and upland areas located on BLM-administered lands. The KOPs represented several landscape analysis factors including distance from the project, viewer exposure (transient, stationary, or prolonged), predominant angle of observation, dominant use (i.e., recreation or travel), and average travel speed at which the project could be viewed.

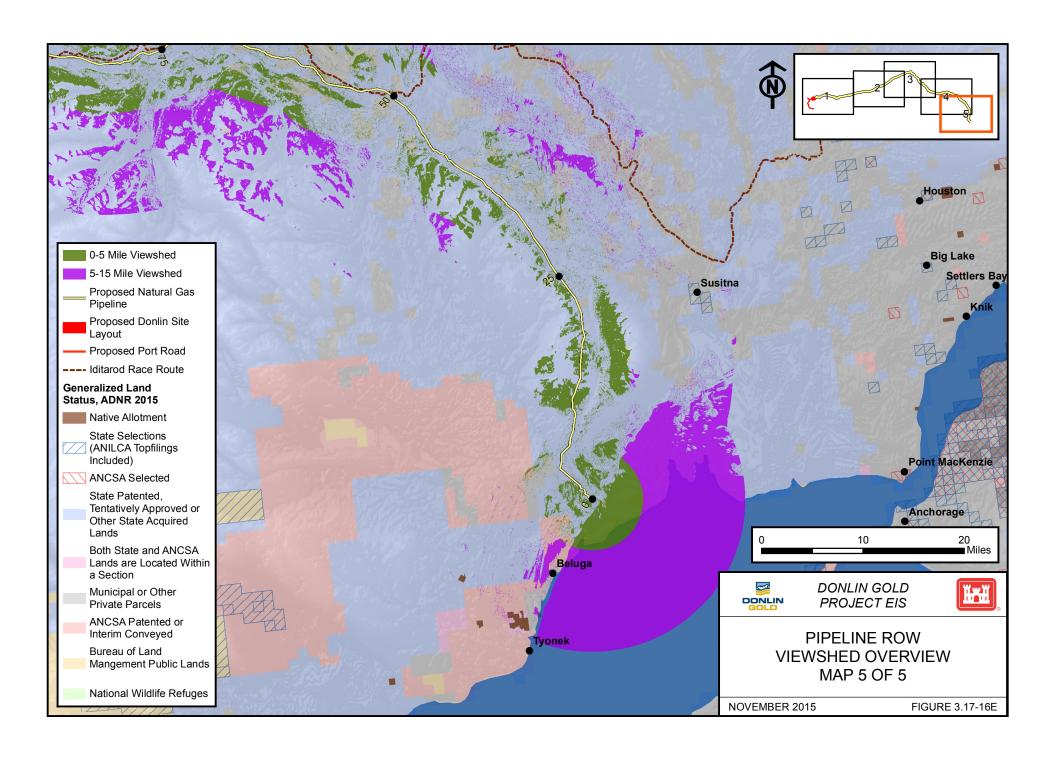


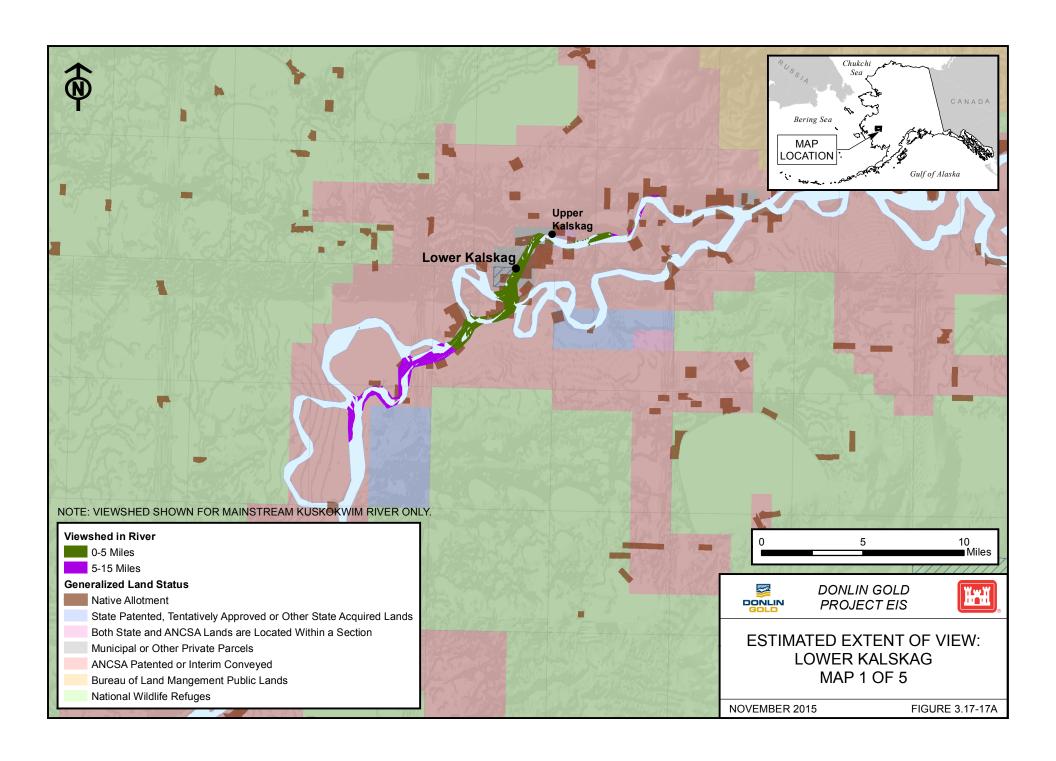


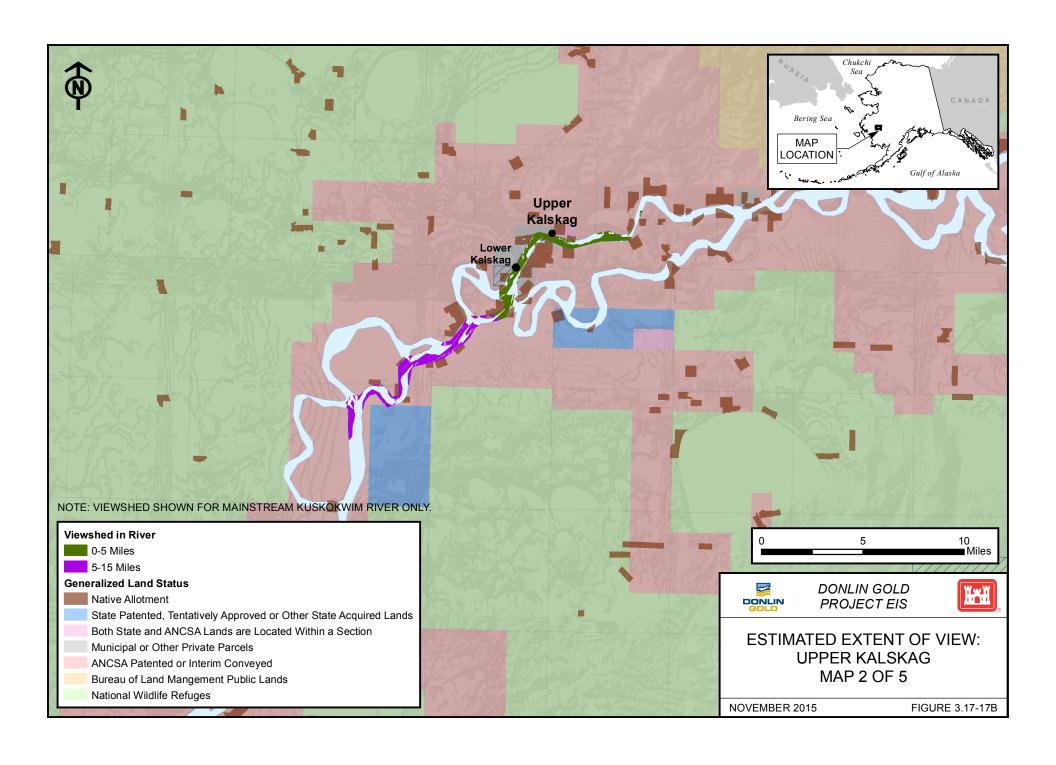


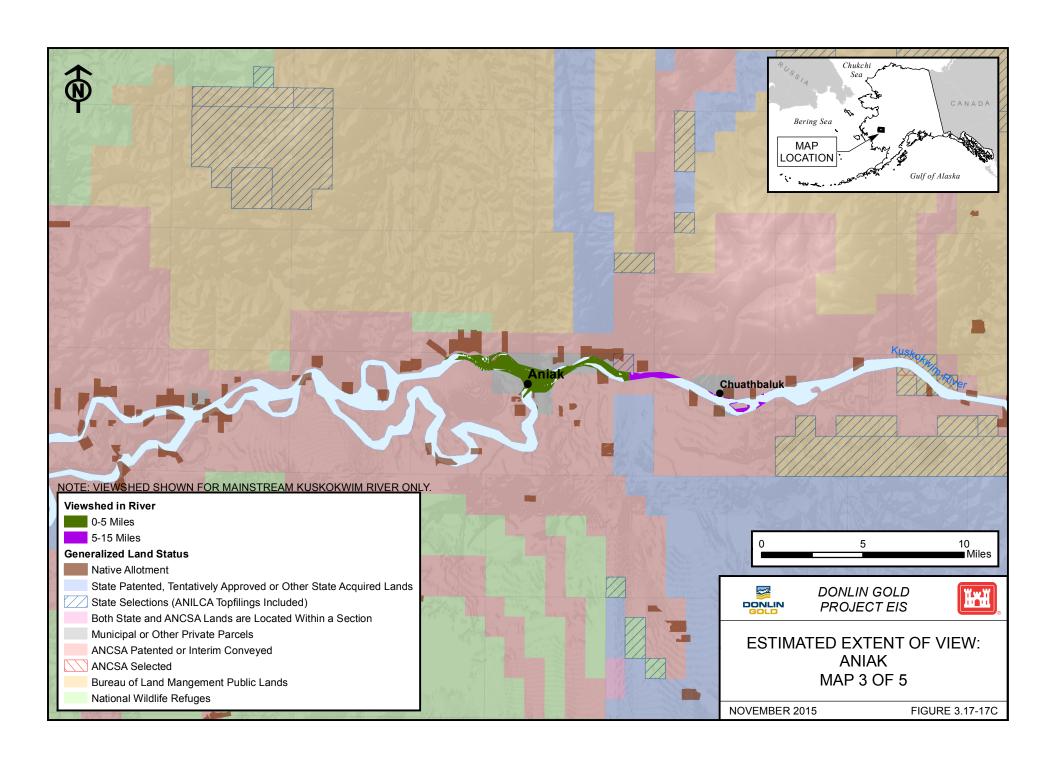


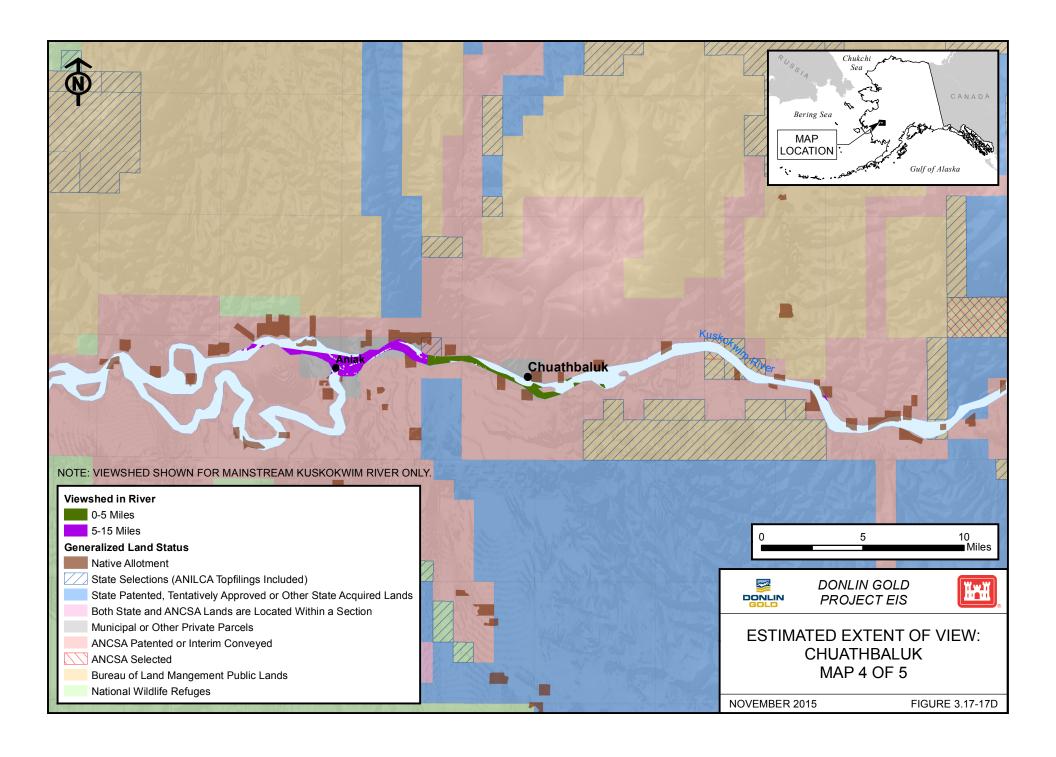


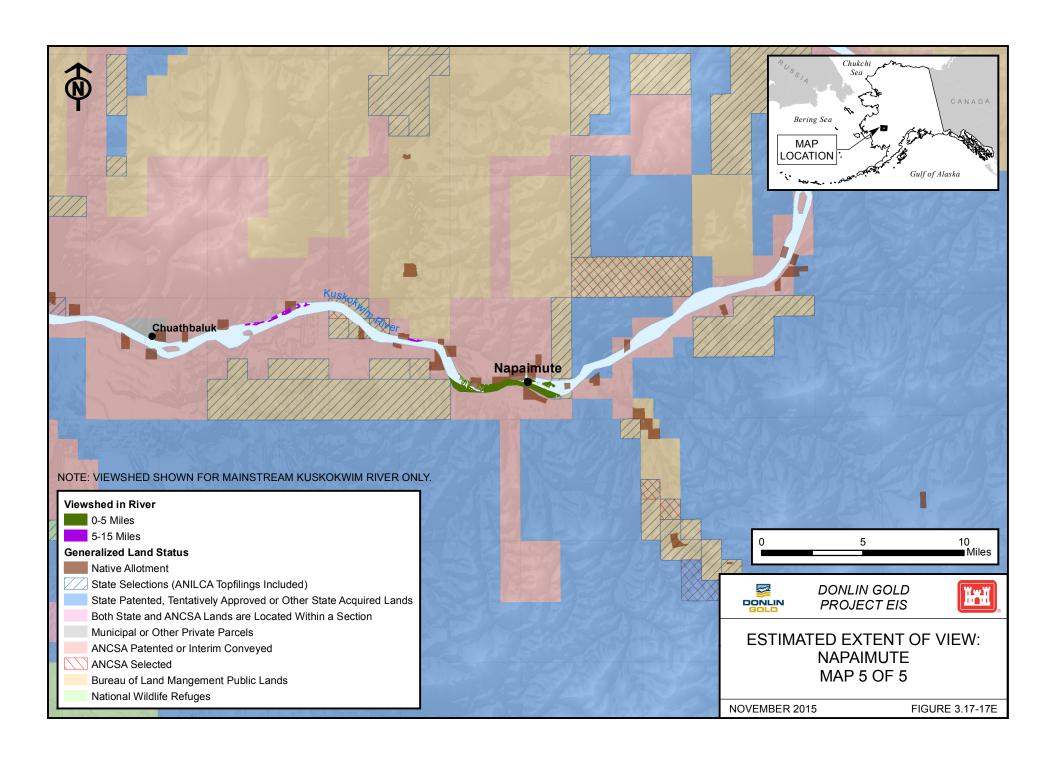












Locations of KOPs, associated physiographic province, applicable analysis factor, and target project components are described in Table 3.17-2, below.

Table 3.17-2: Summary of Key Observation Points used to Assess Visual Resources along the Proposed Pipeline ROW

KOP Name(s)	Physiography	Analysis Factors	Project Component Assessed	
Village of Crooked Creek	Middle Kuskokwim River	Foreground / middleground views; at grade / inferior (lower elevation) viewer position	Mine Site; Construction-related barge traffic (except Alternative 4)	
Villages Napaimute; Chuathbaluk; Aniak; Upper Kalskag	Middle Kuskokwim River	Foreground view; at grade / superior (higher elevation) viewer position	Barge traffic	
Lower Kalskag	Lower Kuskokwim River	Foreground view; at grade / superior viewer position	Impacts to landscape character from project-induced barge traffic	
Angyaruaq (Jungjuk) Port	Middle Kuskokwim River	Foreground view; viewer position at grade from river	Port site and mine access road (Alternative 2); Devil's Elbow, a culturally important location on the River	
Birch Creek Crossing	Lower Kuskokwim River	Foreground view; viewer position at grade from river	Port site and mine access road (Alternative 4)	
Big River; Windy Fork; George River; East Fork George River	Tanana Kuskokwim Lowland	Foreground / middleground; viewer position at grade from river	Pipeline; VRI analysis; VRM conformance	
Kuskokwim River Crossing - at ROW	Lower Kuskokwim River	Foreground views; viewer position at grade from river	Pipeline	
Windy Fork	Tanana Kuskokwim Lowland	Foreground views; viewer position at grade from river	Pipeline; VRI analysis; VRM conformance	
Big River - Upland	Tanana Kuskokwim Lowland	Foreground/middleground and Background Views; superior viewer position	Pipeline; VRI analysis; VRM conformance	
Farewell Station Airstrip	Tanana Kuskokwim Lowland	Foreground/Middleground Views; viewer position at grade from airstrip	Pipeline	
North Fork Kuskokwim; INHT1; INHT2; INHT3; INHT4; INHT5	Tanana Kuskokwim Lowland	Foreground/middleground and Background Views; viewer position at grade, superior, and from air	Pipeline; INHT	
Rainy Pass	Alaska Range	Foreground/middleground Views; superior viewer position	Pipeline; INHT	
Dalzell Gorge	Alaska Range	Foreground/middleground Views; superior viewer position	Pipeline; INHT	
Mount Susitna	Lower Matanuska River Valley	Foreground/middleground Views; superior viewer position	Pipeline	

Source: ARCADIS 2013a

3.17.3.1.3 PHOTOSIMULATIONS

To support the visual resource impact analysis, and disclose expected visibility of project components from various vantage points, photographic simulations were prepared for eight vantage points. Simulations were produced by rendering project components using 3D computer models, and super-imposing these images onto photographs taken at KOPs. Project components were depicted under operational conditions, including a pipeline ROW width of 50 feet and assumed revegetation following 15 years. Model parameters account for environmental factors such as viewing angle and light conditions, thereby resulting in a virtual representation of the appearance of the proposed project. Photosimulations were prepared for the following KOPs:

- Angyaruaq (Jungjuk) Port (Figure 3.17-18)
- East Fork George River (Figure 3.17-19)
- Kuskokwim River near Devil's Elbow where the pipeline ROW would cross (Figure 3.17-20).
- Big River Uplands (Figure 3.17-21)
- Farewell Station Airstrip (Figure 3.17-22)
- Alaska Range Happy Valley (Figure 3.17-23A and Figure 3.17-23B)
- · Dalzell Gorge (Figure 3.17-24)
- Mount Susitna (Figure 3.17-25)

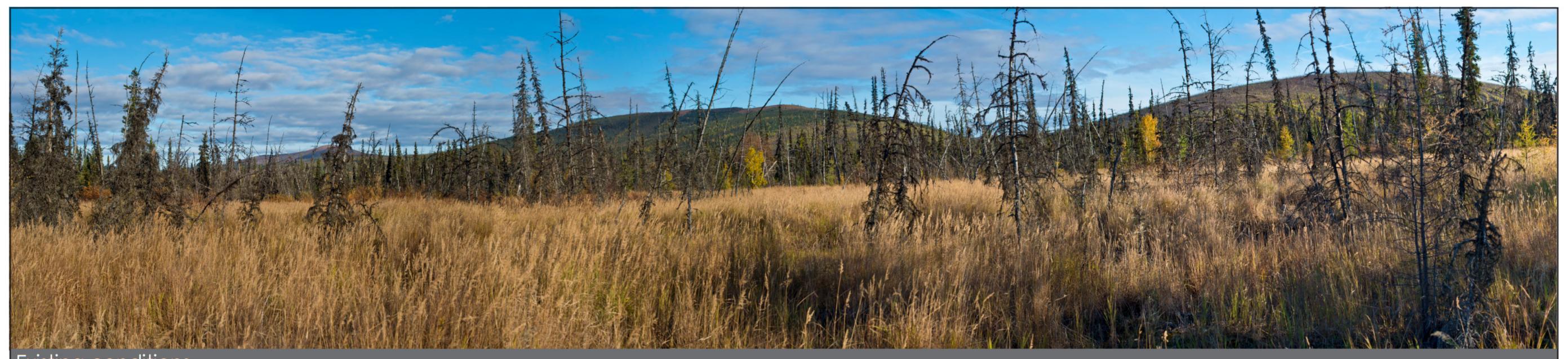
Due to the high quality of the simulations rendered, the sizes of the files make them difficult to include here in original format. The figures below are lower resolution but applicable for this analysis. The high-resolution figures are available for download on the EIS website: DonlinGoldEIS.com.

3.17.3.1.4 BLM CONTRAST RATING PROCEDURE

The BLM Contrast Rating Procedure was used to determine visual contrast that could result from the construction and operations of the Donlin Gold Project based on photosimulations depicting project features. This method assumes that the extent to which the project results in adverse effects to visual resources is a function of the visual contrast between the project and the existing landscape character (BLM 1986b). This assessment focused on two components that influence visual contrast: object visual characteristics and viewshed limiting factors.

- Object Visual Characteristics The object's visual characteristics pertain to the size and scale of the object, its form and line (geometry), surface color, and texture relative to the surrounding environment. The motion of the object is also considered in this assessment. Scale dominance for the project was described as "not visually evident", "visually evident", and "dominant".
- Viewshed Limiting Factors Viewshed limiting factors pertain to attributes of the viewer that affect perception of visual contrast. For example, viewer engagement or experience, viewer motion, distance, and viewing geometry influence perception of visual contrast.



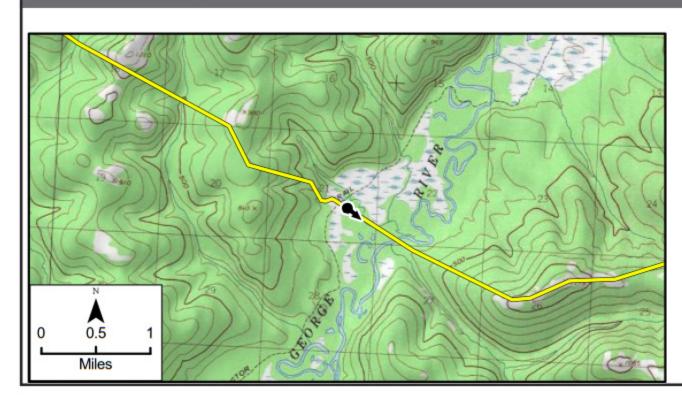


Existing conditions



Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

Viewpoint Location

Proposed Gasline Route

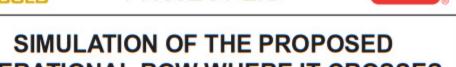
Photographic Information View directed southeast across the George River

Time of photograph: 6:04 PM
Date of photograph: 9-21-13
Weather condition: Partly Cloudy
Viewing direction: Southeast
Latitude: 62° 3′ 57.038″ N
Longitude: 157° 20′ 52.721″ W

Lighting condition: Sidelight



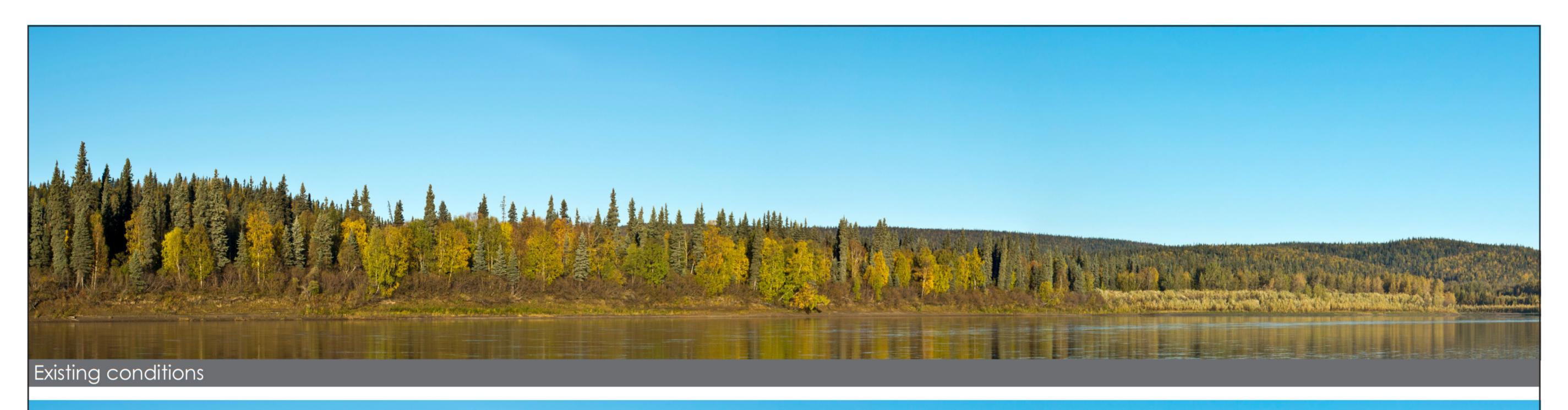
DONLIN GOLD PROJECT EIS



OPERATIONAL ROW WHERE IT CROSSES
THE GEORGE RIVER VALLEY

NOVEMBER 2015

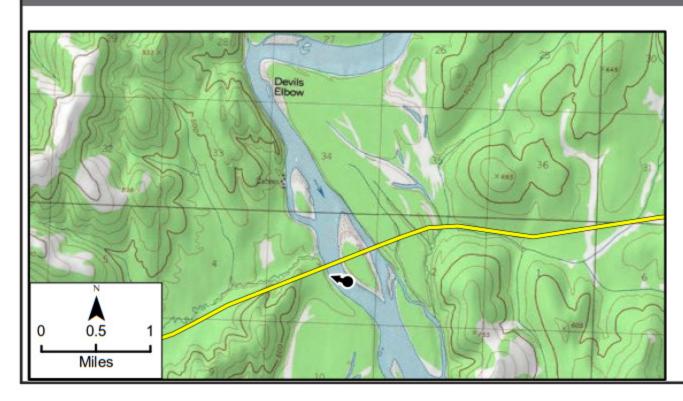
FIGURE 3.17-19





Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

Viewpoint Location

Proposed Gasline Route

Photographic Information View directed upriver toward Devils Elbow

Time of photograph: 9:43 AM Date of photograph: 9-22-13 Weather condition: Cloudy Viewing direction: Northwest 62° 6' 36.938" N Latitude: 156° 12' 58.050" W Longitude:

Lighting condition: Sidelight



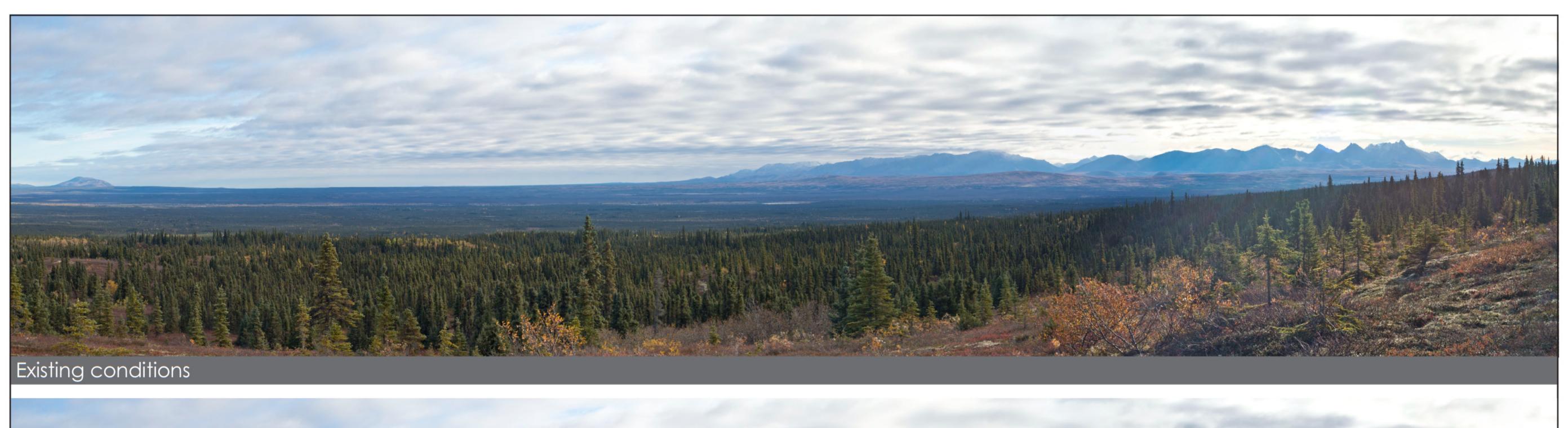
DONLIN GOLD PROJECT EIS



SIMULATION OF THE PROPOSED **OPERATIONAL ROW WHERE IT CROSSES** THE KUSKOKWIM RIVER

NOVEMBER 2015

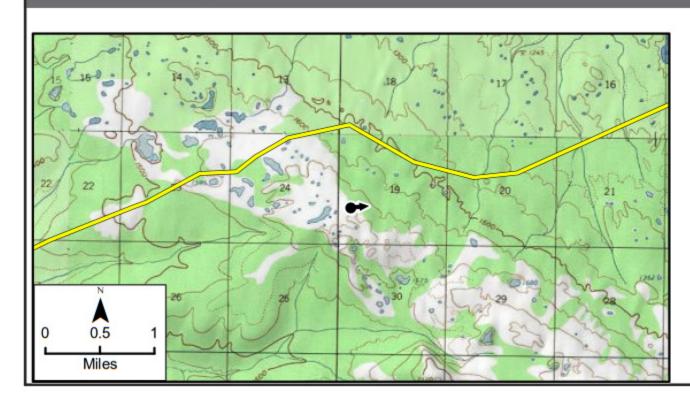
FIGURE 3.17-20





Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

Viewpoint Location

Proposed Gasline Route

Photographic Information View directed east toward Big River

Time of photograph: 10:46 AM
Date of photograph: 9-22-13
Weather condition: Clear
Viewing direction: East

Latitude: 62° 14' 22.955" N Longitude: 154° 55' 19.353" W

Lighting condition: Sidelight



DONLIN GOLD PROJECT EIS

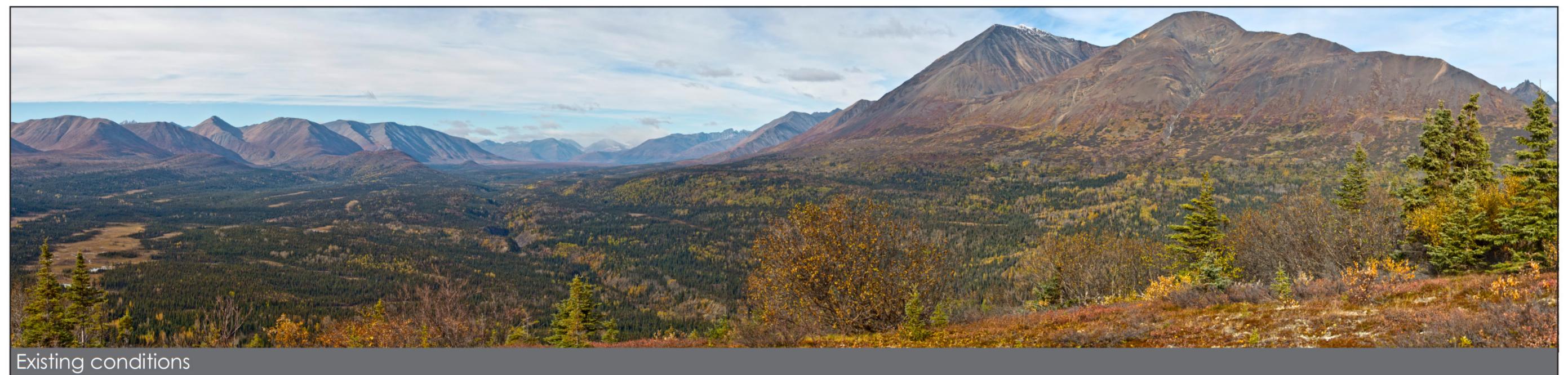


SIMULATION OF PROPOSED OPERATIONAL ROW WHERE IT CROSSES THE NUSHAGAK-BIG RIVER HILLS PHYSIOGRAPHIC PROVINCE

NOVEMBER 2015

FIGURE 3.17-21

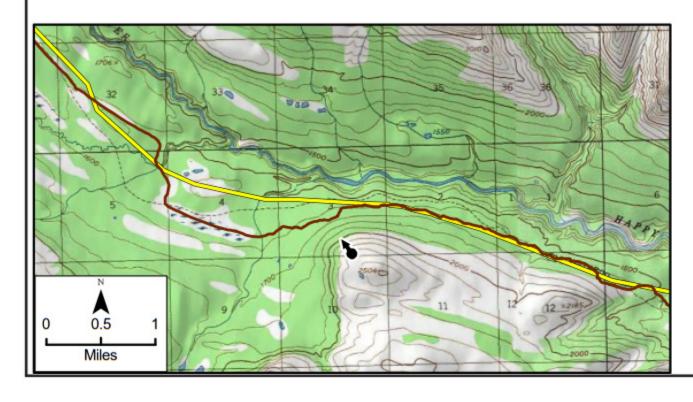






Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

Viewpoint Location

Iditarod National Historic Trail (Modern Race Route)

Proposed Gasline Route

Photographic Information

View direct northwest across Happy River Valley and Iditarod National Historic Trail

Time of photograph: 2:50 PM Date of photograph: 9-22-13 Weather condition: Partly Cloudy Viewing direction: Northwest Latitude: 62° 1' 6.18" N Longitude: 152° 32' 57.09" W Lighting condition: Sidelight



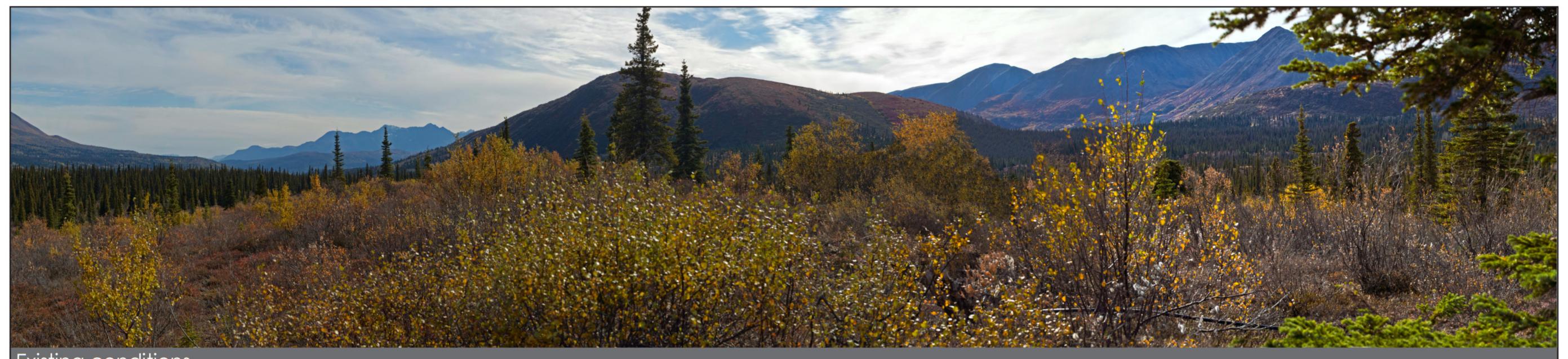
DONLIN GOLD PROJECT EIS



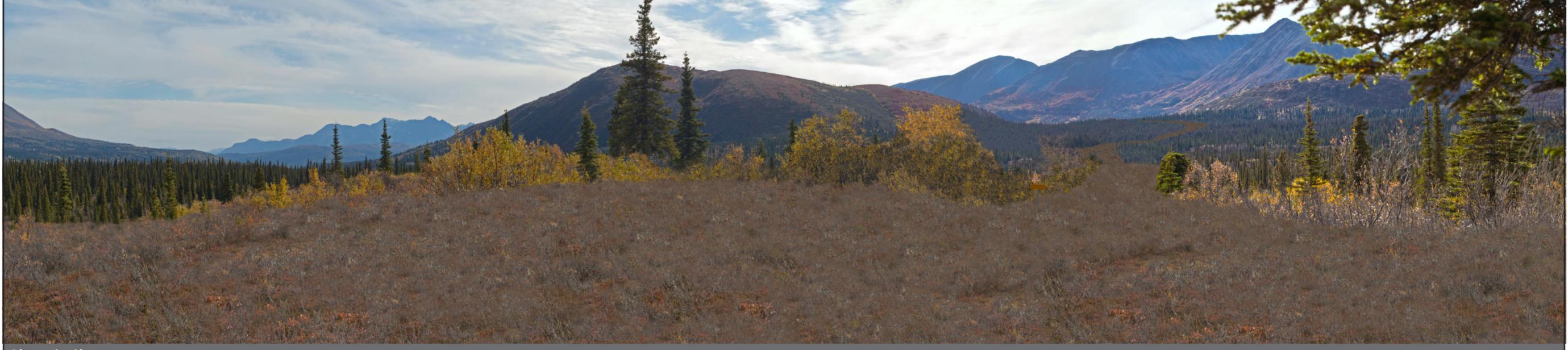
SIMULATION OF PROPOSED OPERATIONAL **ROW WHERE IT CROSSES THE ALASKA** RANGE PHYSIOGRAPHIC PROVINCE

NOVEMBER 2015

FIGURE 3.17-23A

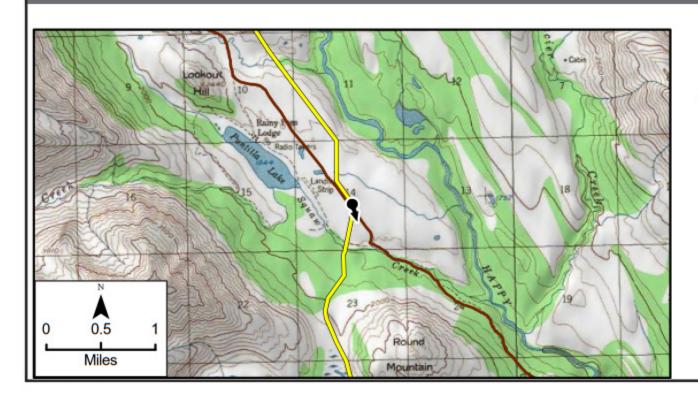


Existing conditions



Simulation

This image has been scaled to fit on 11x17 paper, and therefore should be used for illustrative purposed only. To view this simulation at an accurate scale, images should be printed on a 36x56 size paper, and viewed at approximately 2 feet



Legend

Viewpoint Location

Iditarod National Historic Trail (Modern Race Route)

Proposed Gasline Route

Photographic Information

View directed south from the Iditarod National Historic Trail

Time of photograph: 1:51 PM
Date of photograph: 9-22-13
Weather condition: Partly Cloudy
Viewing direction: Southeast
Latitude: 62° 4′ 55.20" N
Longitude: 152° 42′ 23.52" W
Lighting condition: Sidelight



DONLIN GOLD PROJECT EIS



SIMULATION OF THE PROPOSED
OPERATIONAL ROW WHERE IT CROSSES
THE ALASKA RANGE PHYSIOGRAPHIC
PROVINCE

NOVEMBER 2015

FIGURE 3.17-23B





Levels of contrast are defined as follows:

- None -- The element contrast is not visible or perceived.
- Weak -- The element contrast can be seen, but does not attract attention.
- *Moderate* -- The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- Strong -- The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

3.17.3.1.5 ANALYSIS OF VEGETATION STRUCTURE

The intensity and geographic extent of impacts to visual resources expected to result from vegetation clearing in the proposed ROW and construction areas is largely dependent on the predominant vegetation structure in the vicinity of cleared areas. Where adjacent vegetation is characterized by closed forests or tall trees with contiguous cover, visual contrast of cleared areas against the surrounding landscape is expected to be moderate to strong as ROW edges would appear bold and discrete. Where vegetation is characterized by short, patchy, or irregular vegetation structure, visual contrast is expected to be minimized as ROW edges would appear more similar to surrounding vegetation. Where landscapes are characterized by open forests or a mosaic of vegetation types, visual contrast was assumed to be weak to moderate.

To address this relationship, detailed vegetation community data were reclassified to indicate basic vegetation or landscape structure type: open forest, closed forest, woodland forest, low vegetation, bare ground, and open water. Potential construction or operations-related impacts were then assessed against this landscape classification to develop a broad understanding of how potential impacts to visual resources could manifest across the extent of the proposed and alternative pipeline alignments.

Site-specific and seasonal factors could influence intensity and geographic extent of local impacts. Site specific factors in this analysis included extent of landscape enclosure, degree to which the action would be included in the view, and scale dominance. Seasonal influence was also considered: yellow and red colors of early seral vegetation or shrubs in the construction or operational ROW could contrast surrounding evergreen vegetation at a moderate to strong level during the fall, and contiguous white of snow cover in the alignment could result in strong visual contrast surrounding vegetation in winter.

3.17.3.1.6 IMPACTS TO BLM-IDENTIFIED VISUAL RESOURCE VALUES

On BLM-administered lands, and along the INHT, the results of the contrast rating were used to complete a VRI (BLM 2015c). The VRI will be used to analyze the expected change in VRI values by comparing scenic quality, visual sensitivity, and visual distance zone classifications expected to result from operations of the proposed project. When completed, the VRI analysis will compare estimated effects to original ratings provided in the BLM's VRI of the Bering Sea/Western Interior (BSWI) Planning Area (BLM 2015c) and the INHT Comprehensive Management Plan (CMP) (BLM 1986b). This analysis will be completed within the framework of the BLM VRI, with the goal of understanding how visual resource values may shift as a result of operations of the proposed project. Only long-term, operations related impacts will be considered in this impact assessment.

For BLM-administered land, a plan conformance determination will be completed by comparing the results of the contrast rating procedure and impact assessment with VRM objectives for the BSWI Planning Area, when these are available. This analysis will address only the portions of the project located on BLM-administered lands, as actions proposed on lands administered by the State, Native Corporations, and private lands are not subject to VRM standards. Conformance with the existing VRM class will be analyzed based on the correspondence of expected contrast with the designated VRM class. Only long-term, operations related impacts will be considered in this conformance determination.

3.17.3.2 ALTERNATIVE 1 – NO ACTION

3.17.3.2.1 DIRECT AND INDIRECT EFFECTS

Under the No Action Alternative the project would not be undertaken and permits would not be issued. There would be no mine site development, no transportation facilities, and no natural gas pipeline. Consequently, no visual resources impacts would result from implementation of the No Action Alternative. Alternative 1 would have no effect on climate change as related to visual resources in the EIS Analysis Area.

3.17.3.3 ALTERNATIVE 2 – DONLIN GOLD'S PROPOSED ACTION

3.17.3.3.1 MINE SITE

<u>Direct and Indirect Impacts from Construction</u>

Construction of the proposed Donlin Gold mine site would result in direct effects to visual resources and landscape character resulting from facility modules transport, site preparation, infrastructure installation, and commissioning. Intensity of direct impacts related to site preparation and installation is expected to increase incrementally from low to medium as vegetation is cleared for roads, pads, and airstrips, and infrastructure is developed. Cleared areas would appear as distinct uniform lines or shapes resulting from weak to moderate contrast of tan color and coarse texture of exposed soils against surrounding low stature vegetation characteristic of the uplands of the Kuskokwim Mountains. Additional sources of visual contrast could result from the increase in activity and movement of personnel, presence of equipment, and construction-related dust at the mine site. Collectively, sources of visual contrast would be of low to medium intensity, and consistent with existing activity and infrastructure-related clearing at the Donlin Gold exploration camp. Permanent direct impacts would be localized, primarily due to the large scale and ruggedness of the landscape relative to the project, and ability of existing topography to limit geographic extent of views of the mine site (viewshed extent) (Figure 3.17-15). Construction-related impacts would not affect important or unique resources, as no sensitive viewer groups were identified in the viewshed of the mine site.

Direct and Indirect Impacts from Operations and Maintenance

Operation of the proposed Donlin Gold mine site would result in permanent direct impacts to visual resources and landscape character resulting from operations of mining equipment,

excavation of the American Creek Magnetic Anomaly (ACMA) and Lewis pits, and mining related infrastructure (tailings storage facility, waste rock facility, water management structures). Collectively, excavation and related activity and infrastructure would be of high intensity, resulting from the strong visual contrast of these mine site components against the existing landscape.

The greatest source of visual contrast would result from the open pits, where changes in landform (pit), line (haul roads), and color and texture of soils due to excavation. Likewise, smooth texture and reflective qualities of the water management facilities would introduce strong visual contrast against the more muted tones of the surrounding landscape. Operation-related actions and resulting changes in visual resource attributes could attract attention and dominate the landscape, particularly when viewed from higher elevation vantage points such as overflying aircraft where features would appear dominant. Changes in visual resource attributes of the Project Area would be permanent; however, impacts would be localized, as the viewshed of the mine would be restricted by the rugged topography of the Kuskokwim Mountains (Figure 3.17-15). The context of this action would be common, as no sensitive viewer groups were identified within the analysis area for the proposed mine. Though mine features could be visible from overflying recreational aircraft, viewer exposure would be transient, and experienced within the larger scale context of the landscape. Predominant viewer exposure would be transient, and experienced from the background distance zone (5 to 15 miles) or beyond.

Indirect effects to visual resources could occur if construction or operations resulted in displacement of recreation and/or subsistence use, and subsequent creation of user trails or Off Highway Vehicle (OHV) roads. The localized nature of impacts from construction and operations of the Donlin Gold mine site, low use levels and restrictions to public access, would result in negligible indirect effects and are not considered further in this analysis.

Direct and Indirect Impacts from Closure, Reclamation, and Monitoring

Closure of the mine site is expected to reduce impacts to visual resources and landscape character as a result of restoration of the disturbed area. Though the tailings storage facility, waste rock facility, roads, building, and equipment would be reclaimed, recontoured, and revegetated, strong visual contrast could remain in the mine pit due to the accumulation of water and creation of a pit lake. The smooth, reflective surface of the water would contrast the existing muted tones of the surrounding landscape, and would result in moderate visual contrast that could attract attention. Though localized direct impacts would be reduced, direct impacts to visual resources from the remaining pit lake would be of medium intensity, permanent duration, and would affect resources that are common in context.

Mine Site Summary

At the Donlin Gold mine site under Alternative 2, direct impacts to visual resources and landscape character would be of high intensity, resulting from strong visual contrast of minerelated activity, infrastructure. Direct impacts would be permanent, as changes in landscape character would remain following closure due to infiltration of the combined ACMA and Lewis pit. The geographic extent of impacts would be localized, as views of the Donlin Gold mine site would be largely restricted to the foreground-middleground distance zone (3-5 miles) by rugged topography. Direct impacts would be common in context, as no sensitive viewers were

identified in the vicinity. Collectively, direct impacts to visual resources would alter the natural and intact landscape character of the Kuskokwim Mountains physiographic province within the vicinity of the mine site.

3.17.3.3.2 TRANSPORTATION FACILITIES

The proposed transportation facilities to support construction and operations under Alternative 2 include:

- existing fuel and cargo terminals in the Pacific Northwest and Dutch Harbor;
- improvements to the cargo and fuel barge terminal at Bethel;
- a new port at Angyaruaq (Jungjuk);
- a new 30-mile access road between Angyaruaq (Jungjuk) Port and the mine site;
- a 5,000-foot airstrip near the mine site; and
- use of the Kuskokwim River for barge transit.

Impacts to visual resources would result from construction and operations of ports, fuel storage facilities, and access roads, as well as operation of river barges on the Kuskokwim River.

Based on the scale and level of activity associated with existing fuel and cargo terminals in ports in the Pacific Northwest and Dutch Harbor, potential changes in visual resource attributes are expected to be negligible. Consequently, these areas are not discussed further in this analysis.

Bethel Cargo and Fuel Barge Terminal

Direct effects to visual resources could result from expansion and operations of the cargo port and fuel dock at Bethel. Construction and operations of this facility would result in weak visual contrast from low intensity activity. Construction-related impacts would be temporary and localized, lasting only until the port was complete. Operations-related impacts would be long-term, extending for the 27.5-year life of the Donlin Gold Project. Existing cargo and fuel infrastructure is located in Bethel and the area is used as an active port. Direct impacts would be localized, with view extent largely restricted to an approximately half-mile section of the river surrounding the port, and ridge tops of surrounding mountains. Impacts would be consistent with existing landscape character. Visual contrast would be low to medium intensity, due to size and scale of the facility, and the periodic nature of barge activity operating between Dutch Harbor and Bethel. This action would affect common resources that are found throughout the area, as visual sensitivity within the vicinity of these port facilities is expected to be low.

Angyaruaq (Jungjuk) Port and Mine Access Road

Construction of the Angyaruaq (Jungjuk) Port and mine access road would result in direct impacts to visual resources and landscape character. Sources of visual contrast include the port, mine access road, material sites, and increased activity of construction-related vessel traffic. For all facilities and infrastructure, visual contrast in form and line would increase incrementally to a moderate level as these features were constructed, and excavation at material sites was underway. Collectively, construction-related activity would be of medium intensity, temporary and localized, primarily due to the ruggedness of surrounding mountains limiting geographic extent of views of the mine site (viewshed extent) (Figure 3.17-15 above). Views of

transportation facilities would be largely restricted to ridge tops of surrounding mountains, with limited viewer extent from the Kuskokwim River.

Direct effects could impact the important resource of the Kuskokwim River, as temporary views of construction-related activity could be experienced by river-based viewers in the area. Viewers situated in villages on the Kuskokwim River located upriver of the proposed Angyaruaq (Jungjuk) Port, notably Crooked Creek, would not be affected as these areas are situated outside of the viewshed of these project components.

Long-term direct impacts to visual resources would result from operations of the Angyaruaq (Jungjuk) Port and the mine access road. Direct impacts would be of medium intensity, resulting from strong visual contrast of facilities and related barge and vehicle activity and potential operations-related dust, particularly when viewed from the Kuskokwim River (Figure 3.17-18 (Simulation of the Angyaruaq [Jungjuk] Proposed Port Site). Though the terminus of the mine access road at the port would be visible from the Kuskokwim River, it is expected to appear as a discontinuous bold line that is less dominant than the port facility. Likewise, the access road would be visible as a discrete bold line when viewed from higher elevation or aerial vantage points; however, it would be subdominant to other mine infrastructure. Viewer exposure would be transient, as views of the port would be experienced for approximately 1 mile when traveling up and down river in the vicinity of the Angyaruaq (Jungjuk) Port. Impacts would be localized, limited in geographic extent by the topography of the Kuskokwim River basin.

As described for the mine site, no indirect impacts to visual resources are expected to result from construction or operations of the Angyaruaq (Jungjuk) Port and mine access road.

Kuskokwim River

Direct impacts to visual resources would result from operation of river barges on the Kuskokwim River during Construction and Operations and Maintenance phases of the Angyaruaq (Jungjuk) Port facility. Direct impacts would be of low to medium intensity. Viewer exposure to barge traffic from villages along the Kuskokwim or other river-based locations (i.e., recreation-, subsistence-, or transit-based boating), including portions within the Yukon Delta NWR, would be short and episodic with viewer extent limited by site-specific topography and existing river bends (Figure 3.17-17A through Figure 3.17-17E above). For example, the extent of views from Aniak and Napaimute are largely limited to foreground-middleground distance zones (3-5 miles). From Chuathbaluk, Upper Kalskag, and Lower Kalskag, views of the river are largely downriver where they extend to background distance zones (5-15 miles). Based on the number of barge trips per season traveling upriver and back down, it is estimated that a viewer at a single point would see just over two barge trips per day in a combination of up and downriver tows, which could alter the existing landscape character. Repetitive transit and barge traffic would be of low to medium intensity, short duration, and localized. However, impacts would be spread across the larger geographical region of the Kuskokwim River, from Angyaruag (Jungjuk) Port to Bethel. Direct impacts would be long-term, and important in context, as villages along the Kuskokwim River and landscape character attributes of the Yukon Delta NWR could be affected. No indirect impacts to visual resources are expected to result from barge traffic on the Kuskokwim River.

Airstrip at the Mine Site

Direct impacts would result from construction (improvement) and operations of the airstrip at the mine site. Direct impacts would be of low intensity resulting from weak to moderate visual contrast in color, line, and texture of the existing linear gravel runway against the surrounding muted tones and variable textures of the landscape. Though operational conditions would include regular flight travel to and from the mine site, expected level of activity would not be likely to attract attention from viewers (recreational or subsistence) in the region. Viewer exposure would be transient and predominantly experienced from background distance zones (5-15 miles). Direct impacts are expected to be long-term and localized, as views of the airstrip and related activity would be largely limited to isolated ridge tops located to the west of the mine site (Figure 3.17-15 above). Impacts would affect common resources as no sensitive viewer groups were identified in the vicinity of the airstrip. Indirect impacts to visual resources are not expected to result from operations of the airstrip at the mine site.

Direct and Indirect Impacts from Closure, Reclamation, and Monitoring

Closure and reclamation of many transportation facilities and related operations would result in impacts to visual resources. Permanent direct impacts from closure would be of low intensity, as sources of visual contrast created by barge traffic and the port structure would be removed. However, a primitive barge landing and the access road to the mine site would be retained for monitoring. Direct impacts from closure would be localized and important in context, as landscape character of villages on the Kuskokwim River and the Yukon Delta NWR would be restored.

<u>Transportation Facilities Summary</u>

Direct effects to visual resources and landscape character under Alternative 2 would be of low to medium intensity, resulting primarily from increased barge traffic on the Kuskokwim River and operations of the Angyaruaq (Jungjuk) Port. Direct impacts would result in long-term changes in landscape character attributes of the Kuskokwim River, including the Yukon Delta NWR. Direct impacts would be localized and episodic due to the geographically limited viewshed of villages, and the transient nature of river-based views. The context of direct impacts would be important, as villages on the Kuskokwim River and the Yukon Delta NWR would experience changes in landscape character. No indirect impacts to visual resources are expected to result from construction or operations of transportation facilities. Termination of barge operations after closure of the mine would reduce direct impacts to visual resources, as sources of visual contrast created by barge traffic and the Angyaruaq (Jungjuk) port structure would be removed and existing landscape character at the port site and river would largely be restored.

3.17.3.3.3 NATURAL GAS PIPELINE

Temporary direct impacts from construction would result from vegetation clearing, construction infrastructure, pipeline delivery, and pipeline installation. The intensity and geographic extent of construction-related impacts depends on the specifics of season of construction and the extent of vegetation clearing required for the ROW, as well as the characteristics ancillary infrastructure required, water bodies crossings, and pipe installation method. Within the ROW, the intensity of this action would increase incrementally as ROW

clearing progressed along the alignment, although pipeline installation is generally completed within one season in a given segment of the ROW.

Direct impacts are expected to be greatest in forest areas and woodlands where extensive vegetation removal is required and at activity nodes, where multiple construction-related actions occur simultaneously (mainline construction camps, airstrips, material sites, major pipeline storage yard and/or, HDD crossings) (Appendix T). Across all segments, the increase in activity of personnel and presence of equipment at identified activity nodes could attract attention due to increased movement and equipment in these areas during the construction period.

Viewer exposure and effect on important resources would also vary across the length of the pipeline based on the timing of construction-related actions, as seasonal use patterns differ in the broad geographies crossed by the proposed ROW. Direct effects could be experienced by viewers at ground level or in aircraft. Indirect effects from construction-related visual impacts could occur if existing land users (i.e., recreation or subsistence) are disturbed or displaced to new locations, or to areas maintained for operations of the pipeline (i.e., cleared ROW, airstrips), as a result of the visual effects of the proposed project. This shift in use areas could result in proliferation of user trails, and subsequent creation of distinct lines in the landscape.

Construction would include vegetation removal, staging of equipment and supplies, pipeline delivery, trenching, and installation. Impact analysis of construction activities is organized below into four geographic segments of the proposed pipeline. The analysis takes into account prevailing vegetation structure where ROW clearing would be required, season and timing of activities, location of activity nodes, and anticipated viewer receptors.

Beluga to Threemile Creek (MP 0 to MP 111.6)

Construction between Beluga and Threemile Creek would occur during the winter months, between November and April in the Upper Matanuska River Valley and Alaska Range physiographic provinces. Impacts would be of low to medium intensity, resulting from the moderate to strong visual contrast of cleared areas, infrastructure, and exposed soils against the surrounding landscape. Direct impacts would be temporary and localized, as views of potential construction-related impacts would be shielded from on-the-ground viewers due to tall vegetation and the rugged topography of the Alaska Range. Temporary direct impacts could affect resources that are important in context. In particular, actions could temporarily affect the INHT setting, which has a Congressional designation.

Vegetation Removal – Direct impacts from removal of vegetation for infrastructure sites and the pipeline ROW is expected to range from low to high intensity. Cleared areas of the ROW and activity nodes would appear as discrete, uniform and bold line or shapes that contrast at a moderate to strong level against the contiguous open forests of the Upper Matanuska Valley, and the lower elevation portions of the Alaska Range along the Skwentna and Happy Rivers. Visual contrast is expected to be weak in the southern portion of the ROW, where vegetation is of lower stature. Grading would be required for portions of this spread, and would contribute to the visual contrast. Direct impacts would be localized, as visual contrast would diminish to a weak level beyond foreground-middleground distance zones due to the scale and the level of existing natural lines from drainages, geology, and slide areas in the landscape.

Visual contrast resulting from vegetation clearing within the construction ROW would be temporary, as shrub and groundcover vegetation would reestablish naturally within 10 years. In some areas, revegetation would be expedited through reseeding with Alaska-certified weed-free products.

Temporary direct impacts from vegetation removal could affect resources that are important in context. In particular, actions could temporarily affect the scenic quality and landscape character of the INHT, which has a Congressional designation. Construction-related actions could be seen by winter recreationists where the trail intersects the proposed construction ROW (approximately MP 50-52 and MP 86-106), or where the INHT crosses the viewshed of the proposed construction ROW (Figure 3.17-23A and Figure 3.17-23B). Important landmark features and view areas identified in the INHT CMP (BLM 1982) would not be affected by construction-related actions in this segment. Scenic integrity of one significant viewpoint at the Skwentna River could be affected by temporary higher intensity impacts, as views would be experienced from a foreground vantage point (see Section 3.20.3, Cultural Resources, for additional information on impacts to the INHT).

Temporary indirect impacts to visual resources could result from proliferation or growth of informal user trails in the vicinity of the ROW. In some cases, this already occurs from the various trails associated with the INHT, but it is also possible that new informal trails would emerge from the ROW, particularly in areas that cross, parallel, or are proximate to the INHT. Indirect effects could be of medium intensity and could affect an important resource.

Visual resource attributes of the Alexander Creek and Lake Creek recreation rivers or the Kroto and Moose Creek recreation areas would not be affected by construction-related impacts to visual resources. The construction activities would be shielded from view due to topography and vegetation, or visual contrast would have attenuated to a weak level due to the distance between construction-related actions and these areas. Recreationists in these areas are not expected to experience construction-related impacts as these areas are primarily used during summer months.

Construction Infrastructure – Four activity nodes were identified in Sections 1 and 2 of Spread 2: Beluga Landing, Deep Creek, Skwentna River, and Happy River. At Beluga Landing, construction-related infrastructure is expected to be of low intensity, characterized by weak visual contrast of the camp facilities, large pipeline storage yard, and barge landing improvements against the existing landscape. At Deep Creek, Skwentna River, and Happy River, medium intensity direct impacts to visual resources are expected from construction related infrastructure. Direct impacts would be of medium intensity, resulting from moderate visual contrast of straight lines, cubic forms, and variable textures of camp facilities, airstrips, material sites, and pipeline storage yards against the contiguous open forests of the surrounding landscape. Visual contrast from construction-related infrastructure would be temporary, as facilities would be demobilized upon completion of construction.

Construction infrastructure could affect an important resource, as actions could temporarily affect the landscape character of the INHT, particularly in the vicinity of the Shell and Happy River mainline camps and airstrips. Construction activity at this location could be observed in the immediate foreground (<0.5 miles) by winter recreationists on the INHT between the Skwentna River and Onestone Lake.

Pipeline Delivery – Pipeline for Sections 1 and 2 of Spread 2 would be delivered by barge at Beluga Landing and by existing overland winter roads connecting the George Parks Highway to approximately MP 50.5 at the Skwentna River and MP 42 at Deep Creek. Visual contrast from pipeline delivery would be of moderate intensity and temporary, as this action would be limited to winter construction. Pipeline delivery could affect an important resource, as actions could be observed by winter recreationists on the INHT where the trail crosses (9 locations), collocated with (approximately 4 miles), or is located within 1,000 feet of (approximately 4 miles) the Oil Well and Bear Creek Routes.

Pipeline Installation – Pipeline installation would result in moderate contrast due to the darker color and rough texture of excavated areas and construction mats against the surrounding white snow cover. Strong visual contrast could result at the Skwentna River (approximately MP 50) and Happy River (approximately MP 86), where HDD is proposed. Visual contrast would result from the darker color and rough texture of exposed soils in extra work areas against surrounding snowpack. For both trenching and HDD associated with pipeline installation, personnel and equipment at the outer extent of pipeline construction and activity nodes could attract attention. Visual contrast resulting from pipeline installation would be temporary as extra work spaces would be restored and ground cover vegetation within the operational ROW would reestablish.

Viewer exposure to direct impacts resulting from pipeline installation would be similar to that described for vegetation removal. Temporary impacts related to pipeline installation could affect an important resource, as actions could be observed by winter recreationists on the INHT where the proposed pipeline ROW intermittently crosses or intersects the trail between approximately MP 50-52 and MP 86-106.

Threemile Creek to the South Fork of the Kuskokwim River (MP 111.6 to MP 126)

Construction of the proposed pipeline between Threemile Creek and the South Fork of the Kuskokwim River would occur during the summer months, between June and September. This portion of the proposed ROW is located in the Alaska Range physiographic province.

Vegetation Removal – Temporary direct impacts from removal of vegetation for infrastructure sites and the pipeline ROW is expected to be of low to medium intensity. Vegetation clearing is expected to appear as a uniform line characterized by weak to moderate visual contrast against the predominantly low growing vegetation and horizontal lines at the toe slope of the Threemile Creek and Jones River valleys. Likewise, clearing for infrastructure at Threemile Creek and Bear Paw is expected to result in weak visual contrast against both low growing vegetation and bare ground of the Jones River floodplain. Visual contrast is expected to be strong where linear features or activity nodes cross patches of contiguous open forest, particularly on the east side of the Kuskokwim River.

Vegetation clearing in this area would affect common resources. Direct impacts would be localized due to shielding by the rugged topography of the Alaska Range. Direct impacts of vegetation clearing would not affect the setting of the INHT, and actions are not expected to be visible from the INHT. Viewer exposure is also expected to be limited, as vegetation clearing would occur during the summer months when recreation use on the INHT is low.

Construction Infrastructure – Three activity nodes were identified where the ROW crosses the Alaska Range: Threemile Creek, Bear Paw, and Jones. At each activity node, temporary direct

impacts from construction infrastructure are expected to be of low intensity resulting from weak to moderate visual contrast of camp facilities, airstrips, material sites and pipeline storage yards against the existing rugged and incised landscape. As described for the Beluga to Threemile Creek segment, the increase in human activity and presence of equipment at activity nodes could attract attention due to movement and equipment in these areas. However, the rugged and remote terrain would restrict the geographic extent of views to a localized level. Visual contrast resulting from construction infrastructure would be the temporary, as facilities would be demobilized upon completion of construction actions. Impacts from construction infrastructure would not affect important or unique resources. Though the Threemile Creek activity node could be visible from the INHT, recreationists on the trail are not expected to be affected as activity would occur in the summer months when use of the INHT is low.

Pipeline Delivery – Pipeline delivery would occur by overland winter roads connecting the George Parks Highway to approximately MP 50.5 at the Skwentna River. Visual contrast resulting from pipeline delivery would be similar to that described for the Beluga to Threemile Creek Segment.

Pipeline Installation – Pipeline installation would be of moderate intensity, resulting from the moderate to strong visual contrast of darker color and rough texture of excavated areas against the surrounding landscape, personnel activity, and presence of equipment. Visual contrast resulting from pipeline installation would be temporary, as work spaces would be restored and ground cover vegetation within the operational ROW would reestablish. The context of this action would be common, as no sensitive viewers or special management areas were identified in this area. Winter recreationists on the INHT would not experience construction-related impacts, as installation would occur during summer months (May to August).

South Fork of the Kuskokwim River to the Kuskokwim River (MP 144.4 to MP 247.6)

Construction of the proposed pipeline between the South Fork of the Kuskokwim River and main stem Kuskokwim River would occur during the winter months between November and April. This portion of the proposed ROW crosses the Tanana-Kuskokwim Lowland and the Nushagak-Big River Hills physiographic province and intersects lands administered by the BLM.

Vegetation Removal – Temporary direct impacts from removal of vegetation for infrastructure and the pipeline ROW is expected to be of low to medium intensity. Weak visual contrast would occur where the ROW crosses areas with predominantly low stature vegetation in the Tanana Kuskokwim Lowlands and moderate contrast where the ROW crosses the open forests of the Nushagak-Big River Hills physiographic units. Impacts mechanisms are similar to those described for the Beluga to Threemile Creek Segment. Direct impacts to visual resources resulting from vegetation removal would be temporary and localized. The context of this action would be common, as no sensitive viewers or special management areas were identified in this area. Potential temporary direct impacts of vegetation clearing would occur during the winter months, when recreation, subsistence hunting, and fishing activity in this area is low.

Construction Infrastructure – Two activity nodes were identified in this segment: Farewell and Big River. Minimal changes from existing conditions to are expected at the Farewell airstrip; thus low intensity direct impacts would occur. At Big River, direct impacts from new construction infrastructure is expected to be of low to medium intensity, resulting from weak to moderate visual contrast of camp facilities, airstrips, material sites and pipeline storage yards

against the existing broad topography and large scale of the existing landscape. Visual contrast resulting from construction infrastructure would be temporary and localized, as facilities would be demobilized upon completion of construction. The context of this action would be common, as no sensitive viewers or special management areas were identified in this area.

Pipeline Installation – Pipeline installation would result in temporary direct impacts to visual resources. Pipeline trenching would introduce contrast due to the darker color and rough texture of excavated areas and construction mats against the surrounding white snow cover. Impact mechanisms would be similar to that described for winter pipeline installation in the Beluga to Threemile segment. The context of this action would be common, as no sensitive viewers or special management areas were identified in this area.

Kuskokwim River to Donlin Mine (MP 247.6 to MP 315.2)

Construction of the proposed pipeline between the Kuskokwim River and the Donlin Gold mine site would occur during the summer months. Temporary direct impacts are expected to result from construction of the proposed pipeline in this area. Impacts would be of medium to high intensity, resulting from the moderate to strong visual contrast of vegetation clearing, gravel surfacing of shoofly roads, and exposed soils of trenching a HDD against the surrounding landscape. Direct impacts would be temporary and localized, as views would be shielded from on-the-ground observers due to vegetation and topography.

Vegetation Removal – Direct impacts from removal of vegetation for infrastructure sites, the pipeline ROW, and shoofly roads is expected to be of weak to medium intensity resulting from weak to moderate visual contrast between cleared areas and the surrounding landscape. Weak visual contrast is expected in higher elevation portions of this spread where vegetation is dominated by low stature tundra species, and taller canopy vegetation is limited due to recent wildfire. Visual contrast of cleared areas is expected to increase in areas where vegetation is characterized by contiguous open/closed forest (i.e., George River Valley and tributaries), and where gravel surfacing of ROW and/or shoofly roads is required.

The context of this action would be common, as no sensitive viewers or special management areas were identified in this area.

Construction Infrastructure – No activity nodes are proposed within this segment, though barge landings and pipe storage yards would be constructed on both the east and west sides of the Kuskokwim River. Direct impacts to visual resources from construction infrastructure are expected to be low. Intensity of actions would be low, restricted to construction equipment and temporary camps. Direct impacts would be localized due to the varied topography of the area and large scale of the landscape. The context of this action would be common, as no sensitive viewers or special management areas were identified in this area.

Pipeline Installation – Localized, direct impacts to visual resources are expected to result from installation of the pipeline in this segment, and HDD crossings at the Kuskokwim River, George River, East Fork George River, and North Fork George River. Direct impacts from pipeline installation would be similar to that described in other pipeline segments. Additional direct effects would result from pipeline installation in this segment due to the multiple HDD crossings and summer installation period. Actions associated with the four HDD sites would be of high intensity, resulting from the moderate to strong visual contrast of darker color and rough texture of excavated areas against the surrounding landscape, personnel activity, and

presence of equipment. Visual contrast resulting from pipeline installation would be temporary, as work spaces would be restored and ground cover vegetation within the operational ROW would reestablish. The context of this action would be common, as no sensitive viewers or special management areas were identified in this area.

Direct and Indirect Effects from Operations and Maintenance

Operations of the proposed pipeline would result in long-term direct impacts to visual resources. The operational ROW would have been cleared as part of construction; impacts of ongoing operations would be similar to those described for the construction phase. The primary impact mechanism is the potential for the operational ROW to appear as a bold and discrete line in the landscape as a result of vegetation clearing. As with construction-related vegetation clearing, the level of visual contrast and resulting intensity of visual impacts will depend largely on vegetation communities crossed by the ROW, seasonality, and site-specific landscape character attributes. It is expected that the ROW would result in strong visual contrast during winter months as snow accumulates in cleared areas, thereby resulting in a bold white line against the darker green of surrounding vegetation. Visual contrast of the ROW during the winter season would appear strongest when viewed from the air, as the linear extent of the ROW would be visible.

The proposed ROW under Alternative 2 would be within 1,000 feet of the INHT for approximately 10.5 miles and could affect scenic attributes of the INHT where the trail intersects, parallels, or is located in the vicinity of the proposed operational ROW. Viewers located on the trails would experience potential change in scenic attributes at close proximity, within the immediate foreground (< 0.5 miles).

Anticipated direct impacts to visual resources are discussed below by physiographic province.

Kuskokwim Mountains

Direct impacts to visual resources are expected to result from vegetation management within the operational ROW. Impacts would be of low to medium intensity, resulting from visual contrast of cleared areas of the ROW and shoofly access roads against existing vegetation. In upland portions of this physiographic region, visual contrast is expected to be weak, as surrounding vegetation is predominantly characterized by low tundra or shrub vegetation and large areas where vegetation was burned during recent forest fire. Visual contrast is expected to be moderate and more prominent in scale where the ROW crosses water bodies of the Kuskokwim River and the George River Valley, as vegetation in these drainages is characterized by open to closed forest types. In these areas, ROW edges could appear discrete, particularly when viewed from higher elevation vantage points, low-flying aircraft, or from the river (see Figure 3.17-19).

Though visual contrast would be greater when viewed from the air than from land, the large scale of the landscape and diversity in topography and vegetation would absorb impacts. The predominantly low stature vegetation would reduce the prominence of the ROW in this context. Likewise, air-based viewers would experience the landscape in transit, with views extending to other co-dominant features of the landscape. Expected visual contrast when viewed from the air would be weak to moderate.

Direct impacts would primarily affect common resources. However, the Kuskokwim River, an important resource, would be affected at the proposed ROW crossing. Views of the ROW from the river would be transient, typically experienced while moving up or downriver in motorized craft. Devil's Elbow, a noted feature of the Kuskokwim River, is outside the viewshed of the proposed ROW (Figure 3.17-20). Direct impacts would be localized.

Indirect impacts to visual resources could result from proliferation of user trails stemming from the ROW, particularly in areas near the Kuskokwim River or George River trail. Indirect effects would be of low intensity, long-term, and would affect common resources.

Nushagak-Big River Hills

Long term direct impacts to visual resources are expected to result from vegetation management within the operational ROW where it crosses the Nushagak-Big River Hills physiographic province. Impacts would be of medium intensity, resulting from moderate visual contrast of cleared areas of the ROW against the tall open forests in this area (Figure 3.17-21). Impacts would be localized, as visual contrast is expected to attenuate to a weak level beyond the foreground-middleground distance zone (3-5 miles). Common resources would be affected.

Indirect impacts to visual resources could result from proliferation of user trails stemming from the ROW, particularly in areas near the Big River where existing two track trails are visible on the landscape. Indirect effects would be of low intensity, long-term, and would affect common resources.

Tanana-Kuskokwim Lowlands

Long-term direct impacts to visual resources are expected to result from vegetation management within the operational ROW and aboveground segments of the ROW within the Tanana Kuskokwim Lowland physiographic province. Vegetation management within the operational ROW would be of low intensity, resulting from weak visual contrast of cleared areas of the ROW against the mosaic of low stature and open forest vegetation (Figure 3.17-22). Impacts would be localized as visual contrast is expected to attenuate to a weak level beyond the foreground-middleground distance zone (3-5 miles).

The proposed pipeline would be located aboveground at the Castle Mountain and the Denali-Farewell faults, where it would run aboveground on lateral supports. Views of aboveground segments would be of medium intensity resulting from moderate visual contrast against the surrounding landscape. Though the structure would appear a distinct linear feature on the landscape when viewed at close proximity, it is expected to become less apparent characterized by weak visual contrast from background distance zone (5-15 miles). Viewer exposure would be transient, limited to seasonal recreationists. With the exception of the INHT crossing described below, views of the project features would be experienced from the foreground/ middleground (3-5 miles) and background (5-15 miles) distance zones. Direct impacts would be localized due to the low stature of this feature and the limited extent of the viewshed. Direct impacts from aboveground components would not affect important or unique resources.

Iditarod National Historic Trail

The proposed operational ROW crosses at two locations in the AR-6 Scenic Quality Rating Unit (SQRU) of the INHT west of the South Fork of the Kuskokwim River. Scenic quality within this

unit was ranked as Class A. Dominant scenic attributes of this unit includes the distinct changes in setting as views from the expansive, rugged, and incised Alaska Range transitions to the broad, flat, and panoramic qualities of the Tanana-Kuskokwim Lowlands. Scenic quality attributes are experienced in a directional manner, as this approximately 5-mile trail segment heads northward across the lowland. Two scenic resources are identified in the INHT CMP (BLM 1982): 1) Egypt Mountain, identified as an important landmark feature, and 2) the valley walls of the Alaska Range, identified as a view area. Neither feature would be affected by the proposed ROW. The proposed ROW would cross this unit once at the southern portion of the unit, as the trail emerges from the Alaska Range and enters the Tanana-Kuskokwim Lowlands.

The ROW would be apparent in this area due to vegetation clearing. ROW edges would appear discrete and uniform in riparian and upland forested areas, where viewers would experience medium intensity impacts in the immediate foreground (<0.5 miles), and at a perpendicular angle. Viewer exposure would be transitory, with the scale of the ROW appearing subordinate to existing landscape features. Aboveground portions of the ROW would not be visible. No change to scenic quality factors of landform, vegetation, water, color, influence, or scarcity is expected. Long-term medium intensity impacts to scenic attributes of the INHT would reduce the inventory value for cultural modification; however, the Class A scenic quality classification is not expected to be reduced as a result of operations of the proposed ROW. Diversity in visual experience along this portion of the trail would be maintained. Direct impacts would be long-term and localized.

Indirect impacts to visual resources could result from use of the proposed operational ROW as a travel route, as recreationists and individuals engaged in subsistence hunting could access the ROW from the INHT. This access-induced use could create new user trails that appear distinct due to tread marks, exposed soils, and/or snow trails. The resulting lines would be of medium intensity, localized, and could affect the important resource of the INHT.

Alaska Range

Long-term direct impacts to visual resources are expected to result from vegetation management within the operational ROW where it crosses the Alaska Range physiographic province. Impacts would range from low to medium intensity. In the northwestern portion of this segment (MP 147 and MP 101), impacts would be of low intensity resulting from weak visual contrast of cleared areas against surrounding low stature vegetation and areas of bare ground. In the southeastern portion of this segment (south of MP 101), impacts would be of medium intensity resulting from moderate visual contrast of cleared areas against surrounding open forest and woodlands (Figure 3.17-23A and Figure 3.17-23B). Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points, particularly low-altitude recreational aircraft. Impacts would be long-term and localized as views of the ROW are largely restricted to the foreground-middleground distance zone (3-5 miles) by the rugged topography of the Alaska Range. Long-term, localized direct impacts could affect an important resource where the proposed operational ROW crosses the INHT.

Iditarod National Historic Trail

The proposed operational ROW crosses SQRU AR-1 and AR-2 of the INHT in the Alaska Range physiographic province. SQRU AR-2 is located in the Happy River Valley south of Kohlsaat Peak, and Rainy Pass Creek south of Rainy Pass. Dominant visual elements in this segment

include the expansive, uninterrupted views from the trail due to lack of vegetation along the trail. The INHT would cross the viewshed of the proposed operational ROW for approximately 11 percent of this unit, particularly in the southern portion located in the Happy River Valley (Figure 3.17-23A and Figure 3.17-23B). Because the ROW separates from the INHT corridor at Threemile Creek, scenic quality attributes within the northern portion of this scenic quality rating unit would not be affected.

SQRU AR-1 is located in the Happy River Valley between Destin Peak and Puntilla Mountain. This unit includes dominant visual elements of steep jagged mountains of the Alaska Range, and the expansive views and vistas where the INHT crosses higher elevation terraces. The trail would intersect the viewshed of the operational ROW for approximately 17 percent of this unit. Because of the natural variability in vegetation communities within this unit – including open areas of muskeg bogs – the bold line created from vegetation clearing in the ROW would not appear contiguous, and visual contrast would range from weak to strong. No change to scenic quality factors of landform, vegetation, water, color, influence, or scarcity is expected. Diversity in visual experience along this portion of the trail would be maintained. Long-term medium to high-intensity impacts to scenic attributes of the INHT would reduce the value for cultural modification within both AR-1 and AR-2; however, no overall reduction in scenic quality would occur. The scenic quality within this unit would still be ranked as Class A.

Indirect impacts to visual resources could result from proliferation of user trails stemming from the ROW, particularly in areas that cross, parallel, or are proximate to the INHT. Indirect effects could be of medium intensity, long-term, and would affect a common resource.

Upper Matanuska Valley

Long-term direct impacts to visual resources are expected to result from vegetation management within the operational ROW where it crosses the Upper Matanuska Valley physiographic province. Impacts would be low to medium intensity resulting from weak to moderate visual contrast of cleared areas against the surrounding open forest. Visual contrast is expected to be weak toward the southern portion of the ROW where vegetation is primarily characterized by low growth forms (Figure 3.17-25). Visual contrast is expected to increase to a moderate to strong level where the ROW passes though areas of dense and contiguous forest approaching the Alaska Range. Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. Direct impacts to visual resources are expected to be of medium intensity and localized, as views of the ROW would largely occur from within the foreground-middleground distance zone. Long-term, localized direct impacts could affect an important resource where the proposed operational ROW crosses the INHT (described in detail below).

Iditarod National Historic Trail

Long-term direct impacts could affect the unique resources of the INHT where it passes through SQRUs SL-8, SL-7, SL-6, SL-5, and SL-4 in the Upper Matanuska Valley physiographic province (BLM 1982). Direct impacts to scenic quality as described in the INHT CMP (BLM 1982) are discussed below.

SQRU SL-08 is located south of McDoel and Columbia peaks and extending from approximately Finger Lake to the Happy River. Dominant visual attributes include Happy River to the south, terraced landforms of upland areas, and the edge-break provided by both

vegetation and landform in the southern portion of the unit. Scenic quality is ranked as Class A. The unit is described as a "well-defined visual corridor directed toward the pass, with mountains providing continuous visual landmarks on either side" (BLM 1982). The INHT would be located within the viewshed of the operational ROW for approximately 10 percent (1.4 miles) of this scenic quality rating unit, corresponding largely to areas where the ROW would parallel or intersect the trail. For viewers situated on the trail, the ROW could be apparent as a wider and more uniform corridor particularly where it passes through dense forest characteristically typical in this area. The ROW edges would be discrete and uniform and could appear distinct and unnatural. These areas of localized change could result in a reduction in the score for cultural modification. There would be no change to scenic quality attributes of other factors, particularly the influence of landform, vegetation, and water. The visual corridor directed toward the pass would remain a dominant visual element. However, the integrity of the landscape, as viewed from a significant viewpoint located at the western end of this SQRU (confluence of the Skwentna and Happy rivers) (BLM 1982) could be reduced, as discrete lines of the ROW would be visible from an elevated viewer position. Views directed to the northwest across the Skwentna Rover valley would not be affected. No overall reduction in scenic quality classification is expected to result from operations of the proposed ROW.

SQRU SL-07 is located north of the Skwentna River, extending from roughly the confluence with the Talachulitna River to south of McDoel Peak, are typical of the foothills of the Alaska Range. Though several lakes (Shell Lake, Onestone Lake) are within a mile of the trail, these features are seldom seen due to the spruce-poplar and lowland/upland spruce-hardwood forests. Surrounding mountains are identified as view areas, particularly the Shell Hills to the north. The proposed operational ROW would cross, be collocated, and sited within 3 miles of the INHT within the southern portion of this unit. Where the trail and ROW are separated, views of the ROW would be blocked by existing forest vegetation. A reduction in the ranking of cultural modification from -1 to -4 would result in a reduction of scenic quality score from 16 to 13; however overall scenic quality class would remain Class B.

SQRU SL-06 is located at the intersection of the INHT and the Skwentna River. Similar to the Susitna River crossing, the intersection of the INHT and the Skwentna River provides "significant relief from the vast homogenous forests of the Susitna Lowlands" (BLM 1982). The operational ROW would cross this unit at two locations on the north side of the Skwentna River. With the exception of where the proposed operational ROW crossed the INHT, views of the ROW would be shielded by existing forest vegetation. Visual contrast would be strong; however, because the ROW would cross at a perpendicular angle, viewer exposure would be minimized by recreationists moving through the trail. The ROW would be visible for approximately a half-mile, or 5 percent of the Scenic Quality Rating Unit. A reduction in the ranking of cultural modification from -1 to -4 would result in a reduction of scenic quality score from 20 to 17; thereby reducing the scenic quality class from Class A to Class B. The Skwentna River, the primary factor contributing to scenic quality in this unit, would remain intact as the dominant visual element in this unit.

SQRU SL-05 is located in the Upper Matanuska Valley physiographic province east of Mt. Susitna and Beluga Mountain, is homogenous with little visual interest or diversity. Scenic quality was ranked as Class C. Beluga Mountain is identified as both a viewing area and an important landmark feature (BLM 1982). Cultural modification was identified as a contributing factor to the reduction of scenic quality in this unit. Operation of the proposed project could affect scenic quality attributes of this segment. The viewshed of the proposed project intersects

this SQRU for approximately a half-mile where the ROW could be seen from the background distance zone (5-15 miles). Visual contrast of the proposed ROW as viewed from this location would be weak due to the low stature of surrounding vegetation and the consistency of weak lines of the ROW with existing lines at the toe slope of Beluga Mountain. Though the ROW could be detected by the trained or informed eye, it would not be a dominant feature on the landscape and would not command attention. Further, typical viewers would experience views of the ROW while traveling by dog sled or snow machine, thereby reducing both potential exposure time and degree to which the ROW was focal to views. Though cultural modification could reduce the scenic quality score, no change in scenic quality classification of Class C would occur.

SQRU SL-04 is located in the Upper Matanuska Valley physiographic province, east of Mount Susitna where the trail crosses the Susitna River, has scenic quality attributes contributing the most to the setting. These include the openness of views experienced in this segment compared to surrounding areas where viewer extent is limited by forest. Mount Susitna is identified as both a view area and an important landmark feature (BLM 1982). The proposed ROW would not affect scenic attributes of this scenic quality rating unit as it is located outside the viewshed of the ROW due to shielding of topography of Mount Susitna. No change in scenic quality classification would occur in this area due to operations of the proposed ROW.

Natural Gas Pipeline Summary

Direct impacts to visual resources would result from construction and operations of the proposed pipeline under Alternative 2.

Temporary direct impacts to visual resources are expected to result from construction of the proposed pipeline under Alternative 2. Construction-related actions would be of medium to high intensity, resulting from moderate to strong contrast of vegetation removal, infrastructure, and increased activity for pipeline installation. Intensity of impacts is expected to be greatest in forested areas due to the extent of required vegetation clearing, in areas where HDD would occur during pipeline installation, and other concentrated activity areas. Overall direct impacts from construction would be localized due to the rugged topography, predominant vegetation, or large scale of the landscape. The context of construction-related actions would be common, with the exception of portions of the Upper Matanuska valley and Alaska Range, where the INHT parallels or intersects the proposed ROW. Direct impacts would be temporary.

Long-term direct impacts to visual resources are expected to result from operations of the proposed pipeline under Alternative 2. Direct effects from operations of the pipeline would primarily result from vegetation removal required to maintain the operational ROW (Table 3.17-3). Actions would be of low intensity where the ROW crosses areas characterized by low stature or variable vegetation structure (Kuskokwim Mountains, Tanana-Kuskokwim Lowlands, northern portion of the Alaska Range, and southern portion of the Upper Matanuska Valley). In these areas, visual contrast of the ROW would be minimized as edges would blend with existing low vegetation or open areas. Actions would be of medium intensity, resulting in moderate to strong visual contrast of cleared areas against surrounding forest vegetation in the George River Valley, Nushagak-Big River Hills, southern portion of the Alaska Range, and northern portion of the Matanuska Valley. Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. Direct impacts would be localized, and occur in common and important setting areas as described under construction-

related impacts. Though scenic quality attributes of the trail could be altered in the northern portion of the Upper Matanuska Valley and southern portion of the Alaska Range, no reduction in overall scenic quality classification is expected to result. Indirect impacts to visual resources could occur if there was a proliferation of user-generated trails stemming from the ROW under Alternative 2.

Table 3.17-3: Potential Impacts to Visual Resources Expected to Result from Operation of the Proposed ROW

Physiographic Unit	Predominant Vegetation Community	Relevant Visual Simulation(s)	Expected Visual Contrast	Magnitude of Impact
Kuskokwim Mountains	Low vegetation; closed forest at drainages	East Fork George River Kuskokwim River	Weak to Moderate	Minor direct and indirect impacts
Nushagak-Big River Hills	Open forest	n/a	Moderate	Minor direct and indirect impacts
Tanana Kuskokwim Lowland	Low vegetation; open forest	Big River Uplands	Weak/Moderate	Minor direct and indirect impacts
Alaska Range	Low vegetation; open forest;	INHT #2 INHT #4	Weak/Moderate	Moderate direct and indirect impacts
Upper Matanuska Valley	Open forest/ low vegetation	Beluga Mountain	Weak	Moderate direct and indirect impacts

3.17.3.3.4 CLIMATE CHANGE

The proposed project would contribute to climate change as discussed in Section 3.8, Air Quality, through production of greenhouse gasses. The level of greenhouse gas emissions generated by implementation of Alternative 2 is not likely to create climate change effects to visual resources. If current climate change trends persist, impacts to visual resources would likely be similar to the Vegetation and Wetlands discussion in Section 3.26, Climate Change.

3.17.3.3.5 SUMMARY OF IMPACTS FOR ALTERNATIVE 2

Operation of the proposed Donlin Gold mine site would result in moderate summary impacts to visual resources resulting from mining equipment, excavation of the ACMA and Lewis pits, and mining related infrastructure (tailings storage facility, WRF, water management areas). Collectively, excavation and related activity and infrastructure would be of high intensity resulting from the strong visual contrast of these mine site components against the existing landscape; however, the low number of sensitive viewers at the mine site would result in a lower summary impact. Indirect effects to visual resources could occur if construction or

operations resulted in displacement of recreation and/or subsistence use, and subsequent creation of user trails or OHV roads. Localized moderate direct impacts to visual resources would remain following closure due to remaining open pits.

Moderate summary impact to visual resources would result from construction and operations of transportation facilities under Alternative 2. Low intensity, long-term direct impacts would result primarily from increased barge and port traffic and could affect important resources, as villages on the Kuskokwim River and the Yukon Delta NWR would experience changes in landscape character. Termination of barge operations would result in reduced direct impacts to visual resources, as sources of visual contrast created by barge traffic and the port structure would be removed and existing landscape character at the port site would largely be restored, though the access road and airstrip would remain.

Moderate summary impact to visual resources is expected to result from construction of the proposed pipeline under Alternative 2 (Table 3.17-4). Intensity of impacts is expected to be greatest in forested areas due to the extent of required vegetation clearing, in areas where HDD would occur during pipeline installation, and other concentrated activity areas. Long-term direct impacts to visual resources would primarily result from vegetation removal required to maintain the operational ROW. Actions would be of low intensity where the ROW crosses areas characterized by low stature or variable vegetation structure (Kuskokwim Mountains, Tanana-Kuskokwim Lowlands, northern portion of the Alaska Range, and southern portion of the Upper Matanuska Valley). Actions would be of moderate to high intensity where the ROW crosses areas characterized by open or closed forests (southern portion of the Alaska Range, and northern portion of the Upper Matanuska Valley). Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. Direct impacts would be localized, and occur in common and important setting areas as described under construction-related impacts.

These effects determinations take into account impact reducing design features (Table 5.2-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation) proposed by Donlin Gold as well as the Standard Permit Conditions and BMPs (Section 5.3) that would be implemented. Several examples of these are presented below.

Design features most important for reducing impacts to visual resources include:

- Burying the pipeline and blending with the natural setting would minimize the potential
 for pipeline to dominate the landscape and would decrease visual impacts. Revegetation
 of cleared pipeline ROW would begin as soon as construction is complete. Vegetative
 cover would be maintained during operations to the extent permitted under PHMSA
 regulations (PHMSA regulations require brushing of the 50-foot ROW); minimizing
 visual contrast of ROW by blending with existing low vegetation or open areas.
- During the operations and maintenance phase, concurrent reclamation activities (e.g., certain tiers and areas within the waste rock facility) would be conducted immediately after construction and stabilization and whenever practicable in areas no longer required for active mining.
- Where practicable, the project design includes proposed facilities with earth tone colors characteristic of the natural landscapes during the summer months (browns, tans, warm grays, and greens) with matte-finish to minimize visual impacts. The project design

includes features to minimize visual impacts to the natural landscape to the extent practicable.

- The project design includes routing decisions to minimize visual impacts to the INHT, including collocation of the proposed pipeline with the INHT where appropriate to reduce multiple crossings of the INHT by the pipeline.
- Donlin Gold will work with the INHT Alliance and other user groups to promote trail
 preservation and use. Any actual mitigation measures for impacts to the INHT would be
 agreed to as a part of the Section 106 compliance process and outlined in a
 Programmatic Agreement.
- Salvage growth media and topsoil for revegetation; use of native seed mixes.
- The project design includes routing transmission lines in proximity to the road, where possible, to reduce additional vegetation impacts.
- At the tailings storage facility dry beach, the project design includes installing silt fences, removing snow from active placement areas only, and using polymer dust suppressant.

Standard Permit Conditions and BMPs most important for reducing impacts to visual resources include:

- Developing spill prevention and response type plans as required by federal and state requirements. The plan(s) will prescribe effective processes and procedures to prevent the spill of fuel or hazardous substances and include procedures to respond to accidental releases.
- Developing an Erosion and Sediment Control Plan and Storm Water Pollution Prevention Plans prior to the commencement of ground disturbance activities.
- Preparation and implementation of a Stabilization, Rehabilitation, and Reclamation Plan.

Table 3.17-4: Alternative 2 Impact Levels by Project Component

Impacts		Impact Level				
		Magnitude or Intensity ¹	Duration ²	Geographic Extent ³	Context⁴	Summary Impact Rating ¹⁰
Physiographic Provence	: Mine Site		1			•
Kuskokwim Mountains	Change in Landscape Character ⁵	Intensity: High Visual Contrast ⁶ : Strong Scale ⁷ : Dominant Exposure ⁸ : Transient Distance ⁹ : B	Permanent	Localized	Common	
	Summary:	High	Permanent	Localized	Common	Moderate
Physiographic Provence	: Transportation Fa	cilities				
Yukon Kuskokwim Coastal Lowland	Change in Landscape Character - Bethel	Intensity: Low Visual Contrast: Weak Scale: Not Evident Exposure: Prolonged Distance: F/M	Long-term	Localized	Common	
Kuskokwim Mountains	Change in Landscape Character - Angyaruaq (Jungjuk) Port	Intensity: Medium Visual Contrast: Moderate Scale: Prominent Exposure: Transient Distance: F/M	Long-term	Localized	Important	
Yukon Kuskokwim Coastal Lowland and Kuskokwim Mountains	Change in Landscape Character - Kuskokwim River	Intensity: Medium Visual Contrast: Moderate Scale: Prominent Exposure: Transient Distance: F/M	Long-term	Regional, though localized at villages	Important	
Kuskokwim Mountains	Change in Landscape Character - Mine Strip (Air Strip)	Intensity: Low Visual Contrast: Weak Scale: Not Evident Exposure: Transient Distance: B	Long-term	Localized	Common	

Table 3.17-4: Alternative 2 Impact Levels by Project Component

Impacts		Impact Level				
		Magnitude or Intensity ¹	Duration ²	Geographic Extent ³	Context⁴	Summary Impact Rating ¹⁰
Yukon Kuskokwim Coastal Lowland and Kuskokwim Mountains	Summary	Medium	Long-term	Regional	Important	Moderate
Physiographic Provence:	Pipeline					
Kuskokwim Mountains	Change in Landscape Character	Intensity: Low to Medium Visual Contrast / Scale: Low to Strong – dependent upon vegetation type surrounding ROW and viewer perspective. Exposure: Transient Distance: B	Long-term	Localized	Common, with exception of important resources on the Kuskokwim River	
Nushagak-Big River	Change in Landscape Character	Intensity: Medium Visual Contrast: Moderate Exposure: Transient Distance: B	Long-term	Localized	Common	
Tanana-Kuskokwim Lowlands	Change in Landscape Character	Intensity: Low Visual Contrast: Weak Scale: Subordinate Exposure: Transient Distance: B; however, F/M where the ROW crosses the INHT	Long-term	Localized	Common, with the exception of where the ROW crosses important resources of the INHT	
Alaska Range	Change in Landscape Character	Intensity: Low-Medium Visual Contrast: Weak-Moderate Scale: Evident Exposure: Transient Distance: F/M where the ROW crosses, is collocated, or parallels the INHT	Long-term	Localized	Important, as the proposed operational ROW crosses the INHT	

Table 3.17-4: Alternative 2 Impact Levels by Project Component

Impacts		Impact Level				
		Magnitude or Intensity ¹	Duration ²	Geographic Extent ³	Context⁴	Summary Impact Rating ¹⁰
Upper Matanuska Valley	Change in Landscape Character	Intensity: Low-High Visual Contrast: Weak-Strong Scale: Evident Exposure: Transient Distance: F/M where the ROW crosses, is collocated, or parallels the INHT	Long-term	Localized	Important, as the proposed operational ROW crosses the INHT	
Summary:		Medium	Long-term	Regional	Important	Moderate

Notes:

- 1 Magnitude: A measure of level of visual contrast and scale dominance of the project, and viewer exposure and proximity to project features.
- 2 Duration: Measured by the anticipated temporal extent of impacts (i.e., temporary, long-term, permanent).
- 3 Geographic Extent: Measured by the degree to which the affected area includes immediate foreground (<3 miles), foreground-middleground (3-5 mile), background views (15 miles), or seldom seen (beyond 15 miles) distance zones.
- 4 Context: Measured by the estimated sensitivity of viewers, applicable legislative protection of visual resources, and the potential for impacts to alter the human experience of the landscape.
- 5 Change in Landscape Character: Measured by the combined effect of visual contrast, scale dominance, viewer exposure, and geographic extent of contrast.
- 6 Contrast: The visual contrast of the project feature against existing landscape features, defined as: None The element contrast is not visible or perceived; Weak -- The element contrast can be seen, but does not attract attention; Moderate -- The element contrast begins to attract attention and begins to dominate the characteristic landscape; Strong -- The element contrast demands attention, would not be overlooked, and is dominant in the landscape.
- 7 Scale: A measure of scale dominance of the project relative to landscape features. Ranking includes: Not visually evident, visually subordinate, visually evident, and dominant.
- 8 Exposure: A description of viewer conditions classified as transient, stationary, or prolonged.
- 9 Distance: The typical viewing distance of a particular viewer group.
- 10 Summary Impact Rating: Accounts for impact reducing design features proposed by Donlin Gold and Standard Permit Conditions and BMPs that would be required. It does not account for additional mitigation measures the Corps is considering.

3.17.3.3.6 ADDITIONAL MITIGATION AND MONITORING FOR ALTERNATIVE 2

The Corps is considering additional mitigation (Table 5.5-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation) to reduce the effects presented above. Additional mitigation measures include:

- Clear a narrower construction ROW through sensitive areas to the extent practical to mitigate visual impacts to sensitive cultural resources, use HDD drilling under sensitive features, make a slight realignment of the construction ROW to avoid sensitive areas, and other appropriate measures.
- When clearing brush and shrubs as required to maintain the operations ROW, introduce variation in the edges of clearing (i.e. avoid extended straight lines) to minimize effects to visual resources, to the extent practicable.
- Install signs that clearly distinguish trails from the pipeline ROW at points where the pipeline crosses trails to guide trail users to stay on the trail and off of the pipeline ROW where the two are not co-located. As practicable, revegetate, or otherwise block access to, a narrow strip of the pipeline ROW where it crosses the trail to help steer and keep trail users on the trail and reduce the visual effect of the pipeline ROW crossing.
- Review the success and practicability of measures that were taken to prevent or minimize adverse effects on visual resources on other linear projects, including the Trans-Alaska Pipeline System (TAPS), the Dalton Highway, the Elliott and Parks Highways, and the Anchorage-to-Fairbanks Intertie, and incorporate successful measures into the design and location of the pipeline where reasonable and appropriate.

If these mitigation measures were adopted and required, the effects to visual resources would be somewhat reduced. Mitigation would decrease visual impacts in some sensitive areas through a narrower construction ROW, HDD drilling, signs to keep users away from visually impacted off-trail areas, and a variation in brush clearing to avoid straight line edges of vegetation in the pipeline ROW. The summary impact ratings would remain the same for all project components, including the pipeline. The summary impact rating for the pipeline would still not be reduced from a moderate rating due to the medium intensity, long-term duration, regional extent, and important context of effects to visual resources.

3.17.3.4 ALTERNATIVE 3A – REDUCED DIESEL BARGING: LNG-POWERED HAUL TRUCKS

Alternative 3A would use liquefied natural gas (LNG) instead of diesel to power the large rock trucks that would move waste rock and ore from the open pits.

3.17.3.4.1 MINE SITE

Construction and operations of the Donlin Gold mine site under Alternative 3A would result in similar direct impacts to visual resources as described in Alternative 2.

Though operations of the LNG plant could introduce new sources of strong visual contrast in form, line, color, and texture; this structure is still expected to be less dominant than excavated areas of the Lewis and ACMA pits. Use of LNG-powered rock trucks would not change the level of activity occurring at the mine site during operational phases. Collectively, impact

mechanisms for direct and indirect impacts to visual resources would be similar to that described under Alternative 2.

Direct effects from closure of the mine site are expected to result in similar reductions of indirect impacts to visual resources as described in Alternative 2.

3.17.3.4.2 TRANSPORTATION FACILITIES

Under Alternative 3A, impacts similar to those under Alternative 2 are expected to result from construction, operations, and closure. Though peak annual Donlin Gold Project related barge traffic on ocean routes and the Kuskokwim River would be reduced by about one-third, repetitive transit and barge traffic would be of low intensity, short duration, and localized. Thus, direct impacts would remain similar to Alternative 2.

3.17.3.4.3 NATURAL GAS PIPELINE

Under Alternative 3A, impacts to visual resources expected to result from construction and operations of the natural gas pipeline would be the same as described for Alternative 2.

3.17.3.4.4 SUMMARY OF IMPACTS FOR ALTERNATIVE 3A

Under Alternative 3A, impacts to visual resources expected to result from construction, operations, and closure of the Donlin Gold Project would be the same as described for Alternative 2. While the intensity rating resulting from barge traffic on the Kuskokwim River would be reduced to low, the overall conclusion due to effects from all project components would still be considered the same as for Alternative 2. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. If these mitigation measures were adopted and required, the summary impact rating would be the same as Alternative 2. No additional monitoring measures have been identified to reduce effects to visual resources.

3.17.3.5 ALTERNATIVE 3B – REDUCED DIESEL BARGING: DIESEL PIPELINE

Under Alternative 3B, a 19-inch diameter diesel pipeline would be constructed from Cook Inlet to the mine site along the same corridor as the natural gas pipeline to reduce diesel barging on the Kuskokwim River. Construction and operations of the Donlin Gold mine site under Alternative 3B would result in similar impacts to visual resources as described for Alternative 2. The diesel pipeline would be buried, and an additional segment to Tyonek Dock would cross the Beluga River using HDD.

3.17.3.5.1 MINE SITE

Direct and indirect impacts to visual resources from construction, operations, and closure of Alternative 3B would be similar to those described for Alternative 2. Though increased diesel fuel storage would be required under Alternative 3B, construction-related actions and resulting temporary direct impacts would remain the same.

3.17.3.5.2 TRANSPORTATION FACILITIES

Direct impacts to visual resources resulting from construction of Alternative 3B would be similar to that described for Alternative 2; however, additional direct impacts could result from construction (expansion) of the existing dock at Tyonek and operations of the expanded port facility.

<u>Direct and Indirect Impacts from Construction</u>

Temporary direct impacts to visual resources would result from construction-related actions required to expand the existing dock at the Tyonek North Foreland Facility. Impacts would be of medium intensity resulting from moderate visual contrast of construction equipment and related activity against the existing landscape. Construction-related impacts would be localized, as exiting forest vegetation would limit views of construction-related actions in upland areas. In the Cook Inlet, where viewshed limiting factors such as topography and vegetation do not exist, visual contrast is expected to attenuate to a weak level within 5 miles, thereby maintaining localized geographic extent of impacts in this area. Direct impacts would be common in context, as no sensitive viewers or special management areas were identified in this area.

<u>Direct and Indirect Impacts from Operations and Maintenance</u>

Direct impacts are expected to result from operations of the barge landing at Tyonek would be of medium intensity, resulting from the strong visual contrast of ocean vessels against the existing backdrop of Tyonek when docked at the facility. When present, the large scale of these vessels could alter the landscape character in this localized area; however, they would be consistent with other similar sized vessels present on the east side of the Cook Inlet. Operations-related impacts would be long-term, but intermittent. As in the construction phase, impacts would be localized, and common in context.

Alternative 3B would reduce peak annual Donlin Gold related barge traffic on the Kuskokwim River by approximately one half compared to Alternative 2. Though barge traffic on the river would still occur, this reduction, combined with the temporary duration of exposure to the barges from sensitive viewer locations along the river, would reduce the intensity of impacts to a low level. Direct impacts would be local and long-term, but episodic. Direct impacts would remain important in context, affecting villages along the Kuskokwim River and landscape character attributes of the Yukon Delta NWR. Overall direct impacts to visual resources on the Kuskokwim River would be minor under Alternative 3B. No indirect impacts to visual resources are expected to result from barge traffic on the Kuskokwim River during construction or operations of the Donlin Gold Project under Alternative 3B.

The summary effect of direct impacts to visual resources under Alternative 3B would be minor and long-term. The geographic extent of direct impacts would be localized, as visibility of project features would be largely limited to foreground-middleground distance zones due to existing topography, riverbends, and vegetation. The context of the action would be important, affecting villages along the Kuskokwim River, and landscape character attributes of the Yukon Delta NWR.

3.17.3.5.3 DIESEL PIPELINE

<u>Direct and Indirect Impacts from Construction</u>

Construction and operations of the proposed diesel pipeline under Alternative 3B would result in similar direct impacts to visual resources as described for the natural gas pipeline under Alternative 2.

Construction and operations of Alternative 3B would require an additional pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas line. Impacts to visual resources would result from construction and operations of the pipeline (vegetation clearing, construction infrastructure, pipeline delivery, pipeline installation, and maintenance of the ROW) would be similar to Alternative 2. Visual impacts associated with the additional pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas line is described below.

Vegetation Removal – Direct impacts from removal of vegetation for the additional pipeline ROW would be moderate, with the intensity of this action increasing incrementally as ROW was cleared. As in Alternative 2, the cleared ROW is expected to appear as a discrete and uniform bold line or shape characterized by weak to moderate visual contrast against the surrounding landscape. Visual contrast would be greatest when viewed from aerial locations such as low-flying recreational aircraft; however, lines would appear consistent with existing lines on the landscape surrounding Tyonek Dock. As in Alternative 2, visual contrast resulting from vegetation clearing within the construction ROW would be temporary, as shrub and groundcover vegetation would reestablish naturally within 10 years. In some areas, revegetation would be expedited by re-seeding with Alaska-certified weed-free products (see Appendix H of Pipeline Plan of Development). Geographic extent of impacts would be localized as views would be shielded due to vegetation and topography. Construction related actions would occur in areas common in context, as no sensitive viewers or special management areas are identified in this location.

Construction Infrastructure – There are no activity nodes identified for the additional pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas line.

Pipeline Installation – For the additional pipeline segment, temporary moderate direct impacts to visual resources are expected to result from installation of the pipeline, particularly where crossing of the Beluga River is completed using HDD. Similar impact mechanisms pertaining to pipeline installation would occur with direct impacts of moderate to high intensity, resulting from the moderate visual contrast of darker color and rough texture of excavated areas against the surrounding landscape. Where HDD occurs, additional activity of personnel and presence of equipment could attract attention. Visual contrast resulting from pipeline installation would be temporary, as extra work spaces would be restored, and ground cover vegetation within the operational ROW would reestablish. Direct impacts would be localized, as views of construction-related actions would be limited by existing vegetation. Direct impacts would be common in context as no sensitive viewers or special management areas were identified on the Beluga River.

Temporary direct impacts resulting from construction of the pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas pipeline would be minor, resulting in moderate direct impacts from construction of the pipeline. Direct impacts would be

of medium to high intensity, resulting from vegetation clearing in the construction and operational ROW, and the HDD crossing at the Beluga River. Direct impacts would be localized as views of construction-related actions would be limited by existing vegetation. Direct impacts would be common in context as no sensitive viewers or special management areas were identified in this area.

<u>Direct and Indirect Impacts from Operations and Maintenance</u>

Minor long-term direct impacts are expected to result from operations of the proposed new pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas pipeline. Direct impacts would be of low intensity resulting from weak to moderate visual contrast of the cleared ROW against the existing landscape. Though the ROW would appear as a bold and discrete line, this feature would be consistent with existing lines in the landscape in this area. Direct impacts would be localized as views of the ROW would be largely restricted by existing vegetation. Operation of the ROW would occur in areas common in context as no sensitive viewers or special management areas were identified in this area. The contribution of long-term direct impacts resulting from operations of the pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas pipeline would be minor, resulting in overall moderate long-term direct impacts.

<u>Summary of Impacts for Diesel Pipeline</u>

Moderate temporary direct impacts are expected to result from construction of the proposed ROW. Impacts would be of medium to high intensity, resulting primarily from the moderate to strong visual contrast of vegetation clearing and HDD against the existing landscape. Long-term direct impacts would be reduced to a minor level during the operational phase. Vegetation clearing required to maintain the ROW would be of low intensity, as visual contrast of the operational ROW would be weak to moderate, and consistent with existing lines in the landscape in this area. Direct impacts would be localized (views largely restricted by existing vegetation), and common in context, as no sensitive viewers or special management areas were identified in this area. Direct impacts from construction and operations of the pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas line would be minor, resulting in overall moderate direct impacts of the pipeline.

<u>Summary of Impacts for Alternative 3B</u>

In summary, direct impacts to visual resources under Alternative 3B would be moderate. Impacts would be of medium to high intensity resulting primarily from the strong visual contrast of vegetation clearing against the existing landscape. The geographic extent of direct impacts would be localized as visibility of project features would be largely limited to foreground-middleground distance zones due to existing topography, riverbends, and vegetation. The context of the action would be important, affecting villages along the Kuskokwim River, and landscape character attributes of the Yukon Delta NWR as well as INHT users. Long-term direct impacts would occur during the Construction and Operations and Maintenance phases, but would be reduced during closure. Direct impacts from construction and operations of the pipeline segment between Tyonek Dock and the start of the proposed corridor for the natural gas pipeline would be minor, resulting in overall moderate direct impacts of the pipeline. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most

important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. If these mitigation measures were adopted and required, the summary impact rating would be moderate. No additional monitoring measures have been identified to reduce effects to visual resources.

3.17.3.6 ALTERNATIVE 4 – BIRCH TREE CROSSING PORT

3.17.3.6.1 MINE SITE

Construction and operations of the Donlin Gold mine site under Alternative 4 would result in similar impacts to visual resources as those described for Alternative 2.

3.17.3.6.2 TRANSPORTATION FACILITIES

Direct impacts to visual resources from construction and operations of the BTC Port would result in similar direct impacts to visual resources as described for the Angyaruaq (Jungjuk) Port and the mine access road; however, overall impacts to the Kuskokwim River would be reduced.

<u>Direct and Indirect Impacts from Construction</u>

Similar to construction of the Angyaruaq (Jungjuk) Port and the mine access road, temporary direct impacts to visual resources would be of medium intensity, resulting from visual contrast of port construction, vegetation clearing and grading of the mine access road, excavation of material sites, and increased activity of construction related vessel traffic. For all facilities and infrastructure, visual contrast in form line, color, and texture would increase incrementally as construction progressed. Construction-related activities would be localized, with the project viewshed limited by the Portage Mountains to the west, and the Russian Mountains and foothills to the east. To the south, views are expected to be limited by upland vegetation. Important resources could be affected as viewers engaged in recreation and subsistence on the river would experience views of the facility. However exposure would be temporary and episodic, as views would typically be experienced while in-transit up or down the river.

Direct and Indirect Impacts from Operations and Maintenance

Operations of the BTC Port and mine access road would result in similar direct impacts to visual resources as described for the Angyaruaq (Jungjuk) Port and the mine access road. While the access road to the BTC Port would be longer, impacts are expected to be similar to those found under Alternative 2. For all transportation facilities, direct impacts would be of medium intensity, resulting primarily from strong visual contrast of facilities and related barge and vehicle activity, particularly when viewed from the Kuskokwim River. As described in construction impacts, direct impacts would be localized with visibility of operations-related impacts limited by vegetation and topography.

Operations of the BTC Port and mine access road would result in a reduction in impacts to the Kuskokwim River as compared to Alternative 2. Though barge traffic on the Kuskokwim would be of low to medium intensity, villages along the Kuskokwim River located upriver of the port would not be affected, thereby reducing the effect on important resources of the Kuskokwim River (villages and Yukon Delta NWR).

As in Alternative 2, no indirect impacts to visual resources are expected to result from barge traffic on the Kuskokwim River during construction or operations of the Donlin Gold Project.

Closure and reclamation of the Birch Tree Crossing Port would result in reduced indirect impacts to visual resources as sources of visual contrast would be removed and existing landscape character would be restored.

3.17.3.6.3 NATURAL GAS PIPELINE

Construction and operations of the natural gas pipeline under Alternative 4 would result in similar impacts to visual resources as described for Alternative 2.

3.17.3.6.4 SUMMARY OF IMPACTS FOR ALTERNATIVE 4

The construction, operations, and closure of the Donlin Gold Project under Alternative 4 would result in similar direct and indirect effects to visual resources as described for Alternative 2. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. If these mitigation measures were adopted and required, the summary impact rating would be the same as Alternative 2. No additional monitoring measures have been identified to reduce effects to visual resources.

3.17.3.7 ALTERNATIVE 5A – DRY STACK TAILINGS

Under Alternative 5A, the method of handing tailings the mine site would be dry stack tailings, rather than the wet tailings of the tailings storage facility in Alternative 2. Other project components, i.e., transportation facilities and the natural gas pipeline, would not be affected by this alternative.

The construction, operations, and closure of the Donlin Gold Project under Alternative 5A would result in similar direct and indirect effects to visual resources as described for Alternative 2. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. If these mitigation measures were adopted and required, the summary impact rating would be the same as Alternative 2. No additional monitoring measures have been identified to reduce effects to visual resources.

3.17.3.8 ALTERNATIVE 6A – MODIFIED NATURAL GAS PIPELINE ALIGNMENT: DALZELL GORGE ROUTE

3.17.3.8.1 MINE SITE AND TRANSPORTATION FACILITIES

The construction, operations, and closure of the mine site and transportation facilities under Alternative 6A would result in similar direct and indirect effects to visual resources as described for Alternative 2.

3.17.3.8.2 PIPELINE

Construction and operations of the pipeline under Alternative 6A would result in similar moderate direct impacts to visual resources as described for Alternative 2 for all portions of the pipeline segment, except for the segment extending from Threemile Creek to the South Fork of the Kuskokwim River (MP 111.6-126) where the pipeline would be routed through Dalzell Gorge. Impact mechanisms for the Dalzell Gorge segment would be similar to those described for pipeline construction under Alternative 2, with direct impacts resulting primarily from vegetation removal, construction infrastructure, and pipeline delivery. South of the Tatina and South Fork Kuskokwim River confluence, construction would occur between May and August. North of the Tatina and South Fork Kuskokwim River confluence, construction would occur between November and April.

<u>Direct and Indirect Impacts from Construction</u>

Vegetation Removal and Pipeline Installation – During construction, direct impacts to visual resources from vegetation clearing would be similar to those described for Alternative 2. Direct impacts would be of medium intensity, resulting from vegetation clearing and exposure of soils in excavated areas. Intensity of this action would increase incrementally as ROW clearing progressed along the alignment. Vegetation clearing would appear as a uniform line characterized by moderate visual contrast between Rainy Pass and the Kuskokwim River where the landscape is characterized by bare ground or low stature. Visual contrast would be reduced where the ROW parallels the South Fork of the Kuskokwim River, as vegetation cover in this area is patchy to absent. Direct impacts would be temporary and localized due to the rugged topography and ability of the landscape to limit viewshed extent. Vegetation clearing north of the Tatina and South Fork Kuskokwim River confluence would occur between November and April. These activities could affect the important resource of the INHT as activities could coincide with periods of high use during the winter season.

Direct and Indirect Impacts from Operations and Maintenance

During operations, moderate long-term direct impacts to visual resources are expected to result from vegetation management within the operational ROW in the Dalzell Gorge route. Direct impacts would be similar to those described for the northern portion of the Alaska Range between Threemile Creek and the South Fork of the Kuskokwim River. Direct impacts are expected to be of low intensity resulting from the predominantly weak visual contrast of the operational ROW against the surrounding landscape (Figure 3.17-24). Direct impacts would be localized but could affect an important resource where the proposed ROW crosses SQRU AR-03, AR-04, and AR-5 of the INHT.

SQRU AR-03 and AR-04 are located in the Rainy Pass and Dalzell Gorge section of the Alaska Range. Predominant landscape character attributes include the enclosed visual corridor surrounded by jagged peaks and narrow U-shaped valleys (BLM 1982). This area has expansive views as well as steep descent and curves in the trail. AR-03 is characterized by "significant views", whereas AR-04 is characterized by the steep descent and curves in the trail. The proposed ROW would be collocated with the INHT for large portions of this route, thereby minimizing perceived visual contrast of recreationists on the trail. Although operations of the proposed ROW could lower the value for cultural modification in these units, the expected low intensity and weak visual contrast of the operational ROW in this location – particularly during

summer months – would not reduce overall scenic quality classification scores below the existing.

SQRU AR-05 is located north of the confluence of the Tatina River and the South Fork of the Kuskokwim River, dominant scenic attributes in this unit include the broad and expansive views to the west as the valley opens, and the diversity of lower elevation vegetation communities. Visual contrast of the proposed ROW is expected to increase to a moderate level in this section as removal of vegetation in the operational ROW could create discrete edges that result in a bold and distinct straight line in the landscape. The medium intensity of this action could result in reducing the value of cultural modification in this unit; however, because the ROW is collocated with the trail, perceived visual contrast would be minimized. No reduction in overall scenic quality classification is expected to result due to operations of the proposed ROW.

3.17.3.8.3 SUMMARY OF IMPACTS FOR ALTERNATIVE 6A

Direct and indirect impacts to visual resources expected to result from construction and operations of the mine site, transportation facilities, and pipeline under Alternative 6A would be similar to those described for Alternative 2. However, the proposed ROW would be located within 1,000 feet of the INHT for an additional 18.9 miles, which is considered an important resource.

Moderate direct impacts expected to result from construction would be of medium intensity, resulting from moderate visual contrast of vegetation clearing in the ROW and exposed soils in excavated areas of the pipeline corridor. Direct impacts would be long-term to permanent (extending for the life of the project) and localized, and would affect important resources in the INHT, particularly in the Rainy Pass and Dalzell Gorge area where construction would occur in the winter months. Impacts associated with climate change would also be the same as discussed for Alternative 2. Design features, Standard Permit Conditions and BMPs most important for reducing impacts to visual resources are described in Alternative 2. Additional mitigation measures are also described in Alternative 2. If these mitigation measures were adopted and required, the summary impact rating would be the same as Alternative 2. No additional monitoring measures have been identified to reduce effects to visual resources.

3.17.3.9 IMPACT COMPARISON – ALL ALTERNATIVES

A comparison of the impacts to visual resources by alternative is presented in Table 3.17-5.

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Table 3.17-5: Comparison of Impacts by Alternative*

Impact-causing Project Component	Alt. 2 – Proposed Action	Alt. 3A – LNG-Powered Haul Trucks	Alt. 3B – Diesel Pipeline	Alt. 4 – BTC Port (and Road)	Alt. 5A – Dry Stack Tailings	Alt. 6A – Dalzell Gorge Route
Mine Site:	Contrast: Strong Scale: Prominent	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Transportation Facilities	Exposure: Transient; Geographic Extent: Regional, extending from Bethel to Angyaruaq (Jungjuk) Port.	Exposure: Transient; Geographic Extent: Regional, extending from Bethel to Angyaruaq (Jungjuk) Port.	Exposure: Transient; Geographic Extent: Regional, extending from Bethel to Angyaruaq (Jungjuk) Port, and also including the expanded Port facility at Tyonek.	Exposure: Transient; Geographic Extent: Regional, extending from Bethel to Birch Tree Crossing (downriver of Aniak).	Same as Alt 2	Same as Alt 2
Pipeline: Crosses or parallels INHT in SQRU AR-6, AR- 2, AR-1, SL-8, SL-7, SL-6, SL-5, and SL-4.	Number of INHT crossings: 13 Length of INHT Collocation : 4 miles Length of Trail Segment within 0- 5 mile Viewshed of Pipeline: 14 miles Number of SQRUs crossed: 8	Same as Alt 2	Same as Alt 2, as vegetation management of the ROW between the Tyonek Dock and the start of the proposed corridor would occur in areas characterized by low stature vegetation.	Same as Alt 2	Same as Alt 2	Number of INHT crossings: 34 Length of INHT Collocation: 14.5 Length of Trail Segment within 0- 5 mile Viewshed of Pipeline: 9.5 miles Number of SQRUs crossed: 10
Impact Summaries						
Mine Site	The summary impact is moderate, resulting from high intensity impacts resulting from strong visual contrast of mining equipment, ACMA and Lewis pits, and infrastructure. Impacts would be permanent, as impacts sources of visual contrast would persist following closure of the mine site. High intensity impacts would be localized, and would occur in a common context with no sensitive viewers.	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2	Same as Alt 2
Transportation Facilities	The summary impact is moderate, resulting from low intensity, long-term direct impacts from increased barge and port traffic. Impacts would be regional, though affecting discrete areas along the Kuskokwim River considered important in context.	The summary impact is similar to Alternative 2; however, the intensity of impacts resulting from barge traffic would be less as the number of trips would be reduced by one third.	The summary impact is similar to Alternative 2; however, the intensity of impacts resulting from barge traffic would be less as the number of trips would be reduced by one half.	The summary impact is similar to Alternative 2; however, impacts resulting from barge traffic would not extend above the Birch Tree Crossing Port, thereby eliminating impacts to villages between Aniak and Crooked Creek.	Same as Alt 2	Same as Alt 2
Pipeline	The summary impact is moderate, resulting from low to high intensity impacts due to vegetation clearing. Actions would be of low intensity where the ROW crosses areas characterized by low stature or variable vegetation structure. Actions would be of moderate to high intensity where the ROW crosses areas characterized by open or closed forests. Visual contrast of the ROW would be strongest in these areas when viewed from elevated or aerial vantage points. Direct impacts would be localized, and occur in common and important setting areas as described under construction-related impacts. Impacts would be long-term, localized, and would affect important resources of the INHT.	Same as Alt 2	The summary impact is similar to Alternative 2; however, additional direct impacts could result from construction (expansion) of the existing dock at Tyonek and operations of the expanded port facility.	Same as Alt 2	Same as Alt 2	The summary impact is similar to Alternative 2; however, the pipeline would cross, be collocated, or be located in close proximity to the INHT for a greater percentage of the corridor.
Summary Impact Conclusion	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Notes:

^{*} The No Action Alternative would have no impacts on Visual Resources.

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